Industrial Finishing

REG. U.S. PAT. OFF.

Devoted to the Finishing of Industrial Products
Published Monthly at Indianapolis, Indiana

Vol. III, No. 2 DECEMBER, 1926 $1.00 a Year

GLIDDEN

INDUSTRIAL

Lacq

THE GLIDDEN COMPANY
National Headquarters
CLEVELAND

Since 1884

ZAPON

LACQUERS & LACQUER ENAMELS

The Recognized Standard

Absolute Clarity

IN the production of fine finishes it is essential that the finishing material be free from any foreign substance.

Zapon Lacquers are filtered three time, First, the nitro-cellulose solution is clarified; then the gum solution and, lastly, the finished product. Each filter unit, consisting of two folds of filter cloth and one of laboratory filter paper, is used for not more than ten gallons of any one solution.

THE ZAPON COMPANY

247 Park Avenue, New York City

BRANCHES:

Chicago	45th and La Salle Sts.	Los Angeles	1214 Venice Boulevard
Cleveland	8810 Bessemer Ave.	New Haven	185 Church St.
Detroit	Congress and Griswold Sts.	Oakland	304 12th St.
New York	547 Greenwich St.	San Francisco	160 Seventh St.

ZAPON

The pioneer lacquer finish

Beautiful effects can be obtained by using our

OIL and LACQUER

SHADING STAINS

which are now being used by leading furniture manufacturers throughout the country.

They blend perfectly and can be applied by spraying, brushing or dipping.

Try Our Special Lacquer Fillers

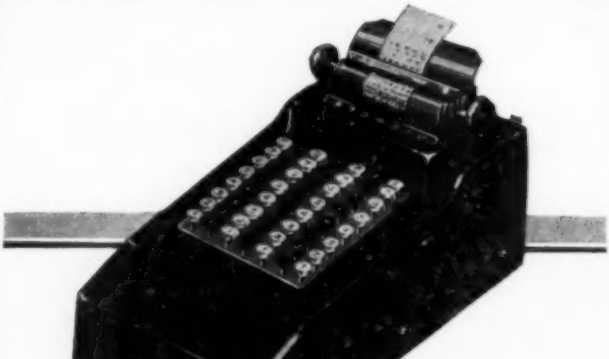
recommended by the largest lacquer manufacturers in the country

Write for samples of both our shading stains and fillers and see what can be accomplished with them. No obligation.

LINDEMAN WOOD-FINISH CO.

MAIN OFFICE AND FACTORY, INDIANAPOLIS, IND.

Warehouses and Branch Offices, Grand Rapids, Mich., and High Point, N. C.



Hilo Crystallizing Lacquer A Sales Stimulator

Hilo Crystallizing Lacquer is an attractive and practical finish that imparts added sales value to products.

This finish can be brushed or sprayed on any hard, non-porous surface and over any other finish—colored enamel, lacquer, japan.

Colors, trade-marks, decorative transfers—all show effectively thru the clear lacquer.

Hilo Crystallizing Lacquer lowers production costs. Fewer undercoats are required because this finish hides minor imperfections in the surface.

This crystallized finish has improved the appearance and increased the sale of many products.

Try Hilo Crystallizing Lacquer on your product. Send for working sample and Bulletin No. 8.

HILO

HILO VARNISH CORPORATION

1 GERRY ST., BROOKLYN, N. Y.

Boston Chicago Philadelphia Pittsburgh

Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

CONTENTS FOR DECEMBER, 1926

With the Editor 5
What Modern Lacquer Is, by W. K. Grinder 9
Painting Special Cabinets, by D. A. H. 12
Use a Hydrometer 13
Selling; Demonstrating; Failing, by Superintendent of Finishing 14
Why Wood Fillers Bleach, by W. S. Edgar 17
Selecting Spray Equipment, by T. E. Moorefield 18
Antiquing; Shading; High-Lighting—II, by Chas. Blandford 23
New Coupling for Metal-lined Hose 29
New Brushes 29
Colors of Fashion for Finishers, by Capt. H. Ledyard Towle 30
Filling Wood Surfaces, by J. H. S. 32
Lacquer Finished Furniture, by Clint Poffenberger 32
Progress in Automobile Finishing, by K. N. Kathju, M. S. 35
Striping—For the Beginner, by Fred Mannhardt 40
Finishing Hobby Horses, by A. J. Daniels 44
Editorial 54
Finishing Foremen Assume Role of Artists.
Finishing Departments for Millwork Factories.
Lacquer Production Increases.
Dealing with Defects.
Care of Brushes, by M. H. J 56
Treating Insides of Furnace Pipes, by J. H. M. 56
Costs in the Finishing Room—II, by E. F. Werner 58
Rubbing Lacquer-Finished Surfaces, by Foreman Finisher 60
Covering Capacity of Mixed Paints, by J. Conselmar 64
Select Materials, Methods and Men to Suit Job, by D. A. Hampson 64
Baked Finishing Section 67
Modern Japanning Practice, by T. E. Moorefield 69
Automobiles Finishes—Baked Enamel, by C. Schroeder 71
Preventing Streaks in Brushed Japan Finish, by H. A. Donaldson 71
Automobile Lacquer Finish Sanding, by W. P. Stewart 72
Scaling, Chalking and Blistering of Exterior Paints, by E. C. Pearson 74
Questions and Answers 76
Enamel on Galvanized Iron 76
Lacquered Brass in Sun 76
Decorating Hot Water Bags 76
Transparent Crackle for Lamp Shades 78
Air Pressure for Spraying "Duco" 78
Bluish Cast on White Lacquered Steel 79
Correction of Linseed Oil Article 79
For Exposed Oak Doors, by J. K. Cooper 79
Spanish Walnut High Lighted 80
Why Lacquer Dries in Spots, by K. C. John 80
Prevent Resin Coming Through Painted Pine 81
Finishing Gum Gun Stocks 81
Cleaning Aluminum Without Injury 82
Metal Ceilings for Bus Bodies, by R. L. Masterson 82
Enameling Hot Galvanized Steel 85
Brush Handle Finishes 89
How Long Lacquer Lasts on Woodwork, by S. P. Wilson 93

Copyright 1926

Published by Practical Publications, Inc., Room 603, 222 E. Ohio St., Indianapolis, Ind. A. T. Gaumer, President; W. H. Rohr, Vice-President and Managing Editor; R. E. Suits, Secretary; E. A. Dosch, Treasurer. Eastern representative, C. A. Larson, 154 Nassau St., New York, N. Y., phone Beekman 3471. Western representative, Howard L. Watrous, 550 Wrigley Bldg., Chicago, Ills., phone Superior 2429. Missouri representative, G. H. Dirhold, 615 Star Bldg., St. Louis, Mo., phone Garfield 4645. Subscription rates, $1.00 per year in U. S. and possessions; $1.50 per year in Canada and $2.00 per year in foreign countries. Advertising rates on application.

DHRLAK

Lacquers, Underlaks and Lacquer Undercoats are made for successful use in your plant, by your men, under your conditions

All mysteries are solved and all experiments are made in our own laboratories

DHRLAK WHITE LACQUER

GLOSS—EGGSHELL—SATIN

Needs no experts to apply it

DHRLAK gives a smooth, even finish extremely hard, elastic and durable. Used over **DHRLAK UNDERCOAT** (Pyroxalin) the entire finish is a matter of minutes.

A five or ten gallon trial of our **DHRLAK** *at barrel price is our introductory offer*

DHRLAK

"Gives Your Work a Bright Future"

DENNY, HILBORN & ROSENBACH

PHILADELPHIA

318 W. Washington Street
Chicago

15 East 40th Street
New York City

With the Editor

A LETTER that is typical of several, which have come to this office lately, contains the following statement:

"My object in writing you at this time is not to tell you about myself, but to tell you that INDUSTRIAL FINISHING, to my knowledge, is the best magazine published for constructive ideas, education and keeping up with the times."

This is from Mr. P. Schroeder, West Webster (near Rochester), N. Y., a foreman finisher of 20 years experience in wood and metal finishing.

While we are naturally elated to receive such commendation from our readers, we feel that these letters have an added significance which is of interest to the entire industry. Five or ten years ago how many foremen finishers or superintendents of finishing did much reading with the idea of learning anything about practical finishing? Few, indeed. The majority of finishing executives had little regard for "book learning" which they considered as being impractical, incomplete and often misleading.

What a change today! Foremen finishers and other production executives are reading. They are eager to learn more about new materials, improved equipment, economical production methods, and the latest finishes and colors. Finishes and colors are now commanding more attention than ever before, throughout the industrial world, and executives responsible for results are finding in INDUSTRIAL FINISHING the logical medium for keeping themselves advised of timely developments, for obtaining practical information and for exchanging ideas.

It is gratifying to the publishers to learn that INDUSTRIAL FINISHING is held in such high regard by so many practical men of long experience, and we are encouraged to further improve this journal as opportunities arise.

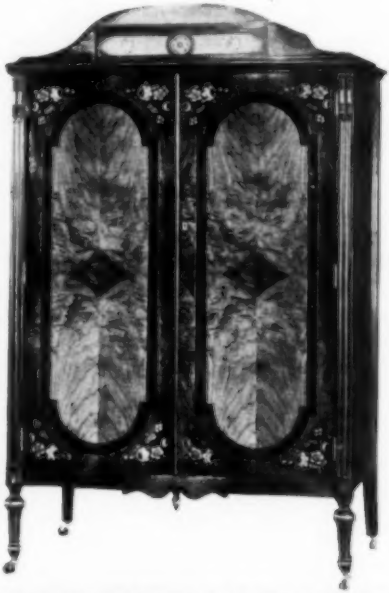
In conclusion we wish to thank all of our readers, advertisers and friends for their support and co-operation, and to wish you all a MERRY CHRISTMAS and HAPPY, PROSPEROUS NEW YEAR.

W. H. Rohr

Managing Editor

LILLY'S
Better Products

Made by Industrial Finishing Specialists



LILLIWOOD LACQUER
(Clear)

Recommended particularly for discriminating manufacturers of furniture

Send for samples and full information

Lilly Varnish Company
INDIANAPOLIS, IND.
Chicago—275 North California Ave.

LILLY'S
Better Products

Made by Industrial Finishing Specialists

SMOOTH COAT
(The best flat)

A finishing room economy. Quick, durable, velvety sheen—dries with a dull rubbed effect—can be rubbed in 48 hours

Send for samples and full information

Lilly Varnish Company
INDIANAPOLIS, IND.
Chicago—275 North California Ave.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

DeVilbiss
Spray-finishing System
Complete Spraying Equipment

DeVilbiss *Small — Handy Invaluable*
Type C Spray Gun

for (1) stenciling, decorating, high-lighting, blending or shading furniture, lighting fixtures and art objects; (2) coating small parts individually; (3) touch-up work of every description; (4) applying materials on any kind of surface; (5) working to an exceptional degree of fineness and accuracy.

The DeVilbiss Type C Spray Gun, with 6-oz. glass container—or metal if preferred, is one of the handiest tools you can have in the finishing room. . . . The gun fits the hand; the forefinger falls naturally on the trigger; a gentle varying pressure on the trigger produces a spray ranging from the most delicate and finest to the widest used for average coating. . . . Type C Gun is simple in construction, easy to clean, and embodies many of the basic advantageous features of the widely known and used DeVilbiss Type A Spray Gun.

The glass container has a label section sand-blasted on the side on which to write color specifications. Extra containers and a light, convenient tray for holding and carrying them are supplied.

Let us tell you more about the Gun and the complete outfit.

THE DEVILBISS CO. 294 Phillips Ave. TOLEDO, OHIO

New York—Chicago—Detroit—San Francisco—Cleveland—Indianapolis—St. Louis
Milwaukee—Minneapolis—Windsor, Ontario

Important enough to be memorized

What Modern Lacquer Is

A clear cut explanation of what types of materials enter into the make-up of the latest nitro-cellulose lacquers, what the function of each type of material is, and how lacquer differs from varnish

By W. K. Grinder

THE term lacquer has been applied to a great variety of products, from the early oriental varnishes down to thin-bodied varnishes of modern manufacture and now to those products containing gun-cotton, pyroxylin or nitro-cellulose.

For a few years to come there will be some confusion caused by this term but there is already a strong tendency to limit the word to nitro-cellulose coating and to add a prefix such as "Chinese" lacquer, "Pekin" lacquer, and so forth, when referring to other types of coatings. Within a few years the term will undoubtedly be used only in connection with nitro-cellulose products.

There are five types of raw materials used in the manufacture of a true nitro-cellulose lacquer. Each raw material serves its own purpose and adds to the properties of the other raw materials to give a finished product of the desired characteristics. These five types of raw materials are broadly classified, as nitro-cellulose or nitrated cotton, solvent and non-solvent liquids, gums or resins, softeners or plasticisers, and pigments or coloring materials.

Sources of Nitro-cellulose

The meaning of the word "nitro-cellulose" is merely cellulose which has been nitrated. There are a great many sources from which cellulose is obtained. The wood of trees and the stalks of a great many plants in the vegetable kingdom are composed mainly of cellulose. One of the purest forms is cotton fibre, and this is the principal source of cellulose used for making nitrated cotton.

It is not necessary to use the long cotton fibres, however, for producing nitro-cotton, since they are more valuable for use in weaving cloth and for other purposes. When the long fibres are removed from the cotton seed, a quantity of short fibres adhere to the seed. These are removed by special machinery and they serve the purpose as well as the longer fibres for making nitro-cellulose. These short fibres are known as "cotton linters."

The linters are contaminated with oil, wax and hull fibres as they are taken from the seed and these impurities must be removed before the process of nitration begins. This is accomplished by repeated washing with various chemical solutions, followed by water to remove all traces of the chemicals. After this the purified linters are dried thoroughly.

By the term "nitration" nothing more is meant than the process of chemically adding nitrogen to another material. In nitrating cellulose or cotton, this is

done by treating the cotton with a mixture of sulphuric acid and nitric acid for the proper length of time. The strength of the acid mixture, the length of time, the temperature and other factors all have a bearing upon the type of nitro-cellulose finally produced. For different purposes the cotton is nitrated in different degrees, but for furniture and automobile lacquers nitro-cotton of about 12 percent nitrogen content has been found most adaptable.

The next step after nitration is to thoroughly boil and wash the nitro-cellulose until all traces of the acids have been removed. The water is then removed by forcing denatured alcohol into the nitrated cotton as the water is forced out. This is done to eliminate danger of explosion, for nitrated cotton as used in the manufacture of lacquer is somewhat similar to gun cotton and gun powder which are harmless while moist but explosive under certain conditions when dry.

The nitrated cotton is very similar in appearance to the original cotton, but it has entirely different properties, one of the chief ones being its solubility or ability to be dissolved in various solvents, which comprise the second class of raw materials mentioned before.

Various Types of Solvents

It is customary to dissolve the nitro-cellulose, while still wet with alcohol, in a suitable combination of solvents. There is a long list of solvent and non-solvent liquids used in the manufacture of lacquer. No one of these liquids is used alone, but a combination is used which will give the proper solvent action on the nitro-cellulose and on the gums, as well as the right scheme of evaporation to insure easy application, a smooth surface and freedom from turning white or "blushing" upon drying.

Some liquids which are solvent for nitro-cotton are not solvents for gums; likewise, many liquids which dissolve gums will not dissolve nitro-cotton. It is quite an art to get the proper proportion of the various liquids necessary to hold both materials in solution and at the same time give the other desirable features.

The question of proper solvent combination is one of the greatest importance in making good lacquers. Usually the solution of gums is made separately from the solution of nitro-cellulose and the two blended together later.

The third class of raw materials, namely, gums or resins, has been used in the manufacture of lacquer materials only during the last few years. Prior to that, as mentioned before, clear lacquers and lacquer enamels were little more than straight solutions of gun cotton to which pigment sometimes was added. The proportion of solid matter was very low and as a result the dried film was very thin, thus requiring a large number of coats before any visible thickness of film could be produced. Furthermore, these earliest lacquer materials lacked adhesive properties or sticking power and could be stripped off quite easily under proper conditions. Likewise they sometimes lacked durability under outside exposure conditions.

These faults are overcome, or lessened at least, by the addition of suitable gums or resins which are very similar to those used in the manufacture of regular oil varnishes. The kind of gums varies, depending upon the re-

sults desired. Damar, shellac, kauri, manila, congo or other gums may be used. Frequently a combination of these resins is employed.

While the gums add certain desirable properties to the lacquer, if nothing further is added they impart a few disadvantages. The principal one is brittleness. The nitro-cellulose solution to which gum has not been added, dries to a very hard, tough film, which, however, lacks adhesion.

The addition of gums improve the adhesion, the thickness and the rubbing properties of the nitro-cellulose film but unless used in conjunction with the proper types and quantities of softeners or plasticisers, they also have a tendency to decrease the toughness and elasticity of the film.

Two Types of Softeners

There are two main types of softeners. Some are non-evaporative, such as castor oil and other non-drying vegetable oils, others are slowly evaporative. Each type has its advantages and disadvantages. If too much of certain slowly evaporative softeners are used a film will be produced which is tough after it has just been applied but which may become brittle with age after the softener has evaporated. On the other hand, too much of the non-drying oil type must not be added or the finished product will not dry quickly.

It is an art developed from years of experimentation to know what softeners and the proportions of each are required to give the desired properties to a lacquer according to the use to which the lacquer is to be put.

The first four classes of raw materials which have just been described are the principal ones used in the manufacture of clear lacquers. For enamels or colored lacquers a fifth class of raw material, namely, pigments or coloring matter, must be used also. In automobile lacquers it is necessary to use only the highest grade of pigments, similar to those used in japan colors, color varnishes and enamels.

Careful selection of the pigments must be made, however, for a few of them react with lacquer and are not at all suited. All colors used must be nearly fast to light and as solid covering as possible. Pigments serve a very important function in lacquers which are exposed to sunlight in that they reflect the actinic rays of the sunlight which quickly break down many clear lacquers that are very tough and durable under inside conditions.

How Pigments Are Added

The pigment is added in different ways by different manufacturers. In some instances it is rolled into the heavy nitro-cellulose solution between huge steel rollers which are kept at a uniform temperature. After the pigment has been thoroughly incorporated, the so-called pigmented colloidal nitro-cotton is dissolved again and the proper gum solutions and other ingredients are added.

Other manufacturers grind the pigment in the regular way on stone mills in special oils and this pigment base is added to clear lacquer of the proper type to produce the enamel. Still others grind the pigment with certain portions of the finished lacquer or with reducers in huge pebble mills. There are other methods in use also. In any case the pig-

ment must be thoroughly ground and carefully incorporated into the other ingredients. Each type of grinding has its advantages for incorporating color matter in the lacquer materials.

To summarize the types of raw materials used and the purpose of each, let us briefly review what has just been said. A true lacquer is made of five ingredients and each of these are desirable for the following reasons:

Nitro-cellulose to give waterproofness, hardness, print resistance and durability.

Solvent and non-solvent liquids to dissolve the nitro-cellulose and resins and to give quick drying, together with ease of application and freedom from blushing.

Gums or resins to add thickness of film and adhesion to the nitro-cellulose solution.

Softeners or plasticisers to counteract the brittle effect produced by the addition of gums, and to restore the original toughness to the nitro-cellulose solution.

Pigments to give hiding power or color to the lacquer wherever needed as well as to reflect the actinic rays of sunlight and make the coating more durable under outside exposure.

When the proper type and the proper quantities of these raw materials are combined in the right manner, a truly remarkable finishing material is produced.

Lacquer and Varnish Differ

Lacquer differs from varnish in many respects. Varnish dries by a combination of evaporation and oxidation. During the first few minutes after varnish is applied, the volatile matter escapes into the air and the varnish takes on a "tack" or sticky feeling. From this point the drying of varnish is largely a matter of the oils and gums absorbing oxygen from the air to form a hard mass.

Unless prevented by special means, this oxidation process does not stop when the varnish has become nearly hard and dry, but continues until the saturation point is reached when most of the oil that originally gave toughness to the film has been converted into a dry, hard mass.

On the other hand lacquer dries by evaporation alone. None of the raw materials used in its manufacture take any oxygen from the air. Within thirty minutes or so the film has dried to where it can be handled and after a few days practically all the volatile materials have evaporated, leaving a hard, tough film that is not easily affected by moisture or climatic changes.—Paint, Oil & Chemical Review.

Painting Special Cabinets

In a woodworking establishment that caters chiefly to building and form lumber work, the workmen are called upon to do occasional jobs for the colony of printers whose plants are in the same town and for whom they sometimes make storage cabinets for the lead spacing material which is called by the misleading name of "furniture." These cabinets take various sizes and shapes according to the whims or needs of the particular buyer, but they are distinguished by their many pigeon holes and the complete utilization of space.

The cabinet shown in the accompanying picture is roughly 2x5x4-ft., and has openings on both the broad faces, as well as trays on top. It is finished in

olive green to match the plant's other equipment.

This sort of a job cannot be sprayed or dipped—and the mill has no equipment for either; in fact, practically everything the concern makes is sent out just as it comes from the machines. But where paint or enamel is required merely on the edges of shelves it is practically impossible to do

The cabinet was painted while mounted on factory truck which served as turn-table.

anything but brush it on—and that is the way this cabinet was finished. The three coats, ending with an egg-shell enamel, were put on by hand. The work was done in a storage room adjoining the woodworking department—in a place comparatively free from dust.

The problem of getting at both sides of the cabinet, and to obtain a good light, is the same one that concerns other executives who take on work outside of their regular line. But in this case, one of the trucks used at the short-length cut-off saw was employed. Placed on this truck, the cabinet, weighing 250-lbs., could be turned at will to bring either side or end to the light as desired. The cabinet was supported at a convenient height and there was no occasion for human hands to touch it from the beginning of the priming coat until the completion of the last coat.

—D. A. H.

Use A Hydrometer

All lacquers should be reduced by hydrometer, not by guess. A hydrometer should be in every paint shop and should be used in thinning the primer and surfacer; also for mixing color varnishes. Use only the thinners furnished with or recommended for the lacquer; never mix one brand of lacquer with another, or add any materials to the lacquer or thinner not recommended by the manufacturer.

A rough coat is a positive sign that the pigments have not been completely atomized, either by not using sufficient air pressure to break up the pigments into fine particles, the wrong type of nozzle, or the lacquer not being reduced sufficiently; a smooth finish demands complete atomization of the pigments.

New Compressor Bulletins

The Quincy Compressor Co., of Quincy, Ill., has recently issued new illustrated bulletins Nos. 2017 and 2020 which give detailed information on water-cooled and air-cooled compressors, in a wide range of sizes suitable for supplying compressed air used in spray finishing and other industrial work.

Lindeman Wood-Finish Co. to Have New Building

The Lindeman Wood-Finish Co., of Indianapolis, announces that its new two-story office building of brick and steel construction will be ready for occupancy about Dec. 20. The company plans to have its offices on the first floor and the laboratory on the second floor.

Selling; Demonstrating; Failing

What it takes to sell and demonstrate finishing materials, equipment, supplies, accessories, etc., and why some firms fail to get due consideration by practical finishing foremen and production executives

By a Superintendent of Finishing

THE boys in my department are readers of INDUSTRIAL FINISHING and have found some very helpful hints in its pages. Claims made by some of the paint people and air-brush companies, give us practical fellows an occasional laugh, but we figure it is the fault of the man who writes the advertising copy. Some of these individuals evidently haven't any practical knowledge of finishing, else they would not make the claims they do.

Last week I received a salesman who is selling sandpaper. He posed as an "engineer" (they are calling them engineers instead of salesmen now!) or at least that was the way his firm had printed his card. He came in and announced that he was ready to help me solve the problems of my finishing department; said this "engineering" service was being inaugurated for every factory using sandpaper, whether it was using his firm's brand, or some other.

I told him I had no problems that an experience of a quarter-of-century in practical work, wouldn't or couldn't solve, but he insisted that the "newer methods" were crowding all us older fellows, and that I had much to learn.

Now, if there is one thing that gets an old experienced finishing foreman's goat, it is for some young salesman to come into his department and tell him he doesn't know his business. The experienced finishing foreman prides himself on being the "best ever" and bows to no one, as far as his own methods are concerned.

That morning I had run through some new articles in a lacquer which we have been using for nearly two years. We went through a lot of grief before we found out how to use that particular lacquer, but after we had conquered it we found it the equal of anything of its kind made, so now we know what it is and how to use it. I took the "engineer" out where the finished pieces were stacked and invited him to demonstrate his paper.

It took me about two minutes to discover that he was almost a novice at sanding. His paper scratched and he made the surface look horrible. After viewing his work soberly for a moment, I asked his "expert" opinion. He scratched his head and said:

"Well, you can't get a good finish because that lacquer you are using is rotten. Our paper showed it up. That's another advantage of using our paper."

I took a piece of his paper, wet it and then sanded out a part of the lacquered article. Then I took a piece of my paper, wet it and sanded out the other half of the article. When I finished, the surface was smooth and sanded down perfectly. There was abso-

Finishes ?

Our Specialists Can Help You!

What is your problem? We can be of assistance to you in your finishing department. Call on us. For instance, our method of shading with Brown Lacquer Glazing not only imparts a softness and evenness of tone, but makes antiquing of furniture easy. This method followed with Gravarco 1009 Clear Lacquer, and Gravarco 1022 Flat Lacquer produces a finish that for durability, economy and appearance is not surpassed.

Send for a copy of our booklet: *"A New Designer from England"*

Grand Rapids Varnish Corporation
GRAND RAPIDS, MICHIGAN
LOS ANGELES -- CHICAGO -- HIGH POINT -- JAMESTOWN

FLAT OIL FINISH

The ideal drawer and inside finish.

Made in natural colors or any color desired.

No filling—no sanding—just spray two coats and the job is complete.

Feels like velvet—looks like it was oil rubbed.

Dries within one hour.

Advance Paint Co.

Manufacturers of
Wood Finishing Materials
INDIANAPOLIS, IND.—*factories*—EVANSVILLE, IND.

Saves more than it costs

Let us show you what a beautiful interior finish this makes by allowing us to express five gallons at the barrel price, or to send our expert service man to demonstrate this material without cost to you.

lutely no difference between the part sanded with his and that sanded with my paper. I showed him the result, led him to the door and advised another "engineering course" in using his own paper. That's a sample of what some of us finishers are up against.

If more manufacturers of lacquers, varnishes, fillers, surfacers, stains, air brushes, etc., would use only such salesmen and service men as are capable of going into plants and giving actual demonstrations (when necessary) in a practical manner, their men would be more welcome and their products would receive greater consideration.

This thing of a nice young chap, who has been schooled briefly within a laboratory only, coming into a plant and attempting to go up against regular production, messes up many sales. It kept one concern recently from getting a year's contract from me for 30 barrels of clear and 15 barrels of pigmented lacquer monthly. The purchasing department allows me to specify the material I use.

Why Wood Fillers Bleach

One of the great cries against lacquer is that it bleaches the filler. This is never so under reasonably fair conditions. Bleaching the filler is due to one of three causes.

First, the filler may be applied in a very dry condition, and if it is not packed into the pores of the wood there is an initial swelling when the lacquer is applied. In a short time this settles down, pulling the lacquer away from each pore, which by light refraction shows "white."

The remedy is obvious; all filler should be applied in as heavy a condition as possible and rubbed in, and on work which is to be of extra quality a double filling operation should be made.

Second, another cause of bleaching may be the fact that soluble colors were used in the preparation of the filler. As the lacquer is applied the solvents dissolve these oil colors and bring them to the top, leaving nothing but the oil and silex, which naturally produces a gray cast.

Third, still another cause may be the use of too much turpentine substitutes and naphtha. This material, staying in the filler, attacks the under side of the lacquer, and again we have the well-known condition of precipitation, producing a grayish cast.

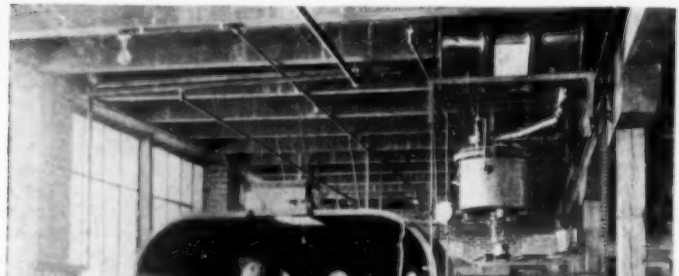
Generally speaking, the filler that is used should not be too short and should not dry with a gray cast. If such a filler is being used the conditions may be corrected by the addition of oil and japan drier, turpentine being used as a thinning agent—W. S. Edgar.

From paper read at Annual Meeting of A. S. M. E., New York, Dec. 6-9, 1926.

The finish of the near future will not be varnish over lacquer for a luster, nor polishing, but a high gloss colored lacquer for the last coat, sprayed by a skilful sprayer who understands his gun, his movements, knows his material and how to apply it and is not afraid to spray on enough material.

Mechanical Agitating Equipment of Large Capacity

Mechanical agitating apparatus for V-type dip tanks, to contain enamel in quantities of 2000 gallons and upward, is included in newly improved equipment announced by the Paul Maehler Co., of Chicago.



Selecting Spray Equipment

The great variety of specialized apparatus and supplies for spray finishing, the development of new equipment from time to time, the use of different finishes, and many other factors deserve important consideration

By T. E. Moorefield

THE variety of materials being applied with the spray gun is growing larger every day. It has been proved that there is a considerable saving in time through the use of the spray as compared to the use of the ordinary hand brush, in the application of most paint, varnish and lacquer materials. Furthermore, the quality of the work is improved in many instances by the use of the spray.

These points of advantage have led enterprising concerns to adopt the spray system for the application of finishing materials on an ever-increasing number of objects which heretofore have been coated by other means or, perhaps, not at all.

Equipment to Suit Materials

In addition to the introduction of long known finishing materials to new uses, by the use of the spray, there have been developed a number of entirely new products which, at the present stage of development, cannot be satisfactorily applied by any process other than that of spraying. As efforts are made to apply new products by this process there is usually a logical development both in the materials and in the spray equipment, so that eventually the problem is worked out quite satisfactorily.

As an illustration, take the application of lacquers and lacquer enamels. Practically every manufacturer of spraying equipment has made changes in the design of his products to meet new sets of conditions arising from the use of these highly volatile materials. Practically every maker of lacquer materials has also made slight changes in his products to make them more suited for spraying. Working together in this way, a common meeting ground is found and good results are eventually secured.

In addition to this continual development in materials and the equipment with which to apply them, the conditions in practically every finishing room vary. The atmospheric conditions, the air pressure, type of spray gun, kind of feed, type of coating material, size and shape of the object, and many other factors, not the least of which is the man behind the gun, all have a bearing on the results obtained.

Since the application of materials by spraying is in a constant state of development and since there are so many factors which influence the results, it is not possible to give, in printed form, any complete set of definite instructions as to how to get good results. What is good today for one set of conditions may be entirely obsolete tomorrow where the conditions have been changed.

There are, however, certain fundamental points which hold true at practically all times, regardless of what kind of material is being applied or what the other conditions may be.

Gun Nozzles

One of the most important requisites to good work is the choice of the proper type of gun and size of nozzle opening, to best apply the particular material at hand. A nozzle that gives perfect results with one material may not be at all satisfactory with another. This is because of the difference in viscosity, ability to flow or level out after striking the work, rate at which the volatile thinners evaporate, and other factors which are entirely different in different types of finishing materials, or even in goods of the same general type but made by different manufacturers.

Air Pressures

Another factor that must be considered simultaneously with the choice of the proper gun and nozzle opening, is the air pressure to be used. The pressure must be varied, as a rule, depending upon the material used, whether it is fed to the spray gun by suction, gravity or pressure, the size of nozzle opening, and such factors.

Air pressure at the nozzle may vary from 30 to 100-lbs. The correct pressure to use with a given gun, a given size nozzle and a given material can be obtained only by the operator experimenting until the desired results are obtained. Once the correct pressure has been established for a given set of conditions, it can be relied upon for future use, so long as none of the conditions are changed.

A general rule, with few exceptions, is that the more viscous or heavy in body a material may be, the higher the air pressure should be, and the wider should be the nozzle opening in the gun, to get good results. This does not hold true in every instance, however. Several types of materials will be discussed individually a little later.

Air Compressors

Compressed air is essential to the use of a spray gun. Compressors may be obtained from the manufacturer of the gun or from a separate source of supply. Where air is available for inflating tires, it also may be used for spraying, if suitable precautions are taken to separate the oil, moisture and dirt from the air before it reaches the gun.

It is advisable that the compressor be sufficiently large to supply a steady flow of air at the correct pressure to take care of the number of guns being operated, without undue overloading. As a general rule about seven cubic feet of air per minute is required for each spray gun in use. The length of the piston stroke, the cross sectional area of the piston, and the number of revolutions per minute determine the quantity of air delivered by a compressor. Some approximate figures of the ratings of different size compressors, the number of guns they will operate, etc., are given in the following table:

	Single Cylinder				Double Cylinder	
Piston Bore and Stroke—inches	2½x3	3x3½	4½x4½	6x6	6x6	7x7
Size of Compressor Pulley—Inches	9x2½	14x2⅝	18x4½	27x5½	27x5½	36x6½
R. P. M. of Compressor Pulley	550	500	400	250	150	200
Cubic Feet of Free Air Per Minute	4.7	7.2	16.5	24	30	62
Pressure—Pounds Per Square Inch	80	80	80	80	80	80
Horse Power of Motor	¾	1	3	5	5	10
Motor Speed—R. P. M.	1750	1750	1750	1750	1750	1200
Size of Motor Pulley—Inches	3	4	4	5	3	6
Number of Spray Guns	1	1 or 2	2 or 3	4 or 5	6 or 7	8 to 12

Typical Ratings of Air Compressors

Clean and Controlled Air

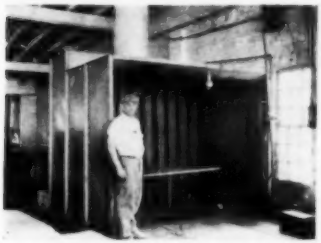
Regardless of the source of air supply or the quantity used, suitable means should be provided for removing the oil, water and dust from the air. An auxiliary oil and water separator which is available in different sizes, styles and makes, is recommended. Its use will more nearly insure the complete elimination of oil, water and dust from the spray line.

It is well to have a reduction valve for regulating the air pressure to the degree best suited for applying the particular goods being used. This should be located near the spray gun, where it will be handy to change the pressure when required.

Heating Material and Air

There has been considerable controversy regarding the wisdom of using heaters for heating finishing materials before they reach the spray gun. For certain heavy bodied goods, no doubt this heating gives better flowing qualities, but there is danger of the formation of skins, and other things may occur which will affect the finished results. It is now possible to obtain practically every type of finishing material which will flow and level out properly without the necessity of heating. Lacquer materials should never be put through a heater.

Where it is deemed advisable to heat the material before applying it, suitable means should be provided for heating the air also, as otherwise the material will be cooled down again within a few inches after it has left



A late type of spray booth with baffle plates at rear. The container suspended above discloses the fact that gravity feed is employed here for supplying finishing materials to the spray gun.

the nozzle, and the results will not be satisfactory.

Fans and Booths

An exhaust fan and spray booth are desirable equipment to use in conjunction with the air brush, since the fumes arising from spray finishing are disagreeable to breathe, and they promote dirt in the shop if not removed. There is now available exhaust equipment which can be installed in any window opening, and this can be used either with or without a booth in which to coat the work. Wherever it can be afforded, however, a booth is recommended, since it helps to confine the spray dust and prevent it from settling on other work in the shop.

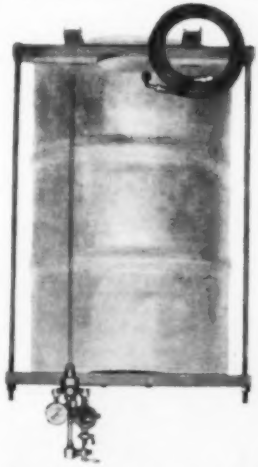
Feeding Material to Gun

The method of feeding the finishing material to the nozzle of the gun may be either by gravity or pressure. The syphon or suction system, sometimes used on small cup guns, is not best adapted for use where surfaces of any large size are to be coated.

In general, the pressure system is the best, as it insures a positive and uniform supply of material always available at the nozzle, ready to be put on the work. The pressure on the material, of course, will have to be regulated to fit other conditions, such as viscosity of material, type of gun, size of nozzle, etc., but in any case it is not wise to carry this pressure beyond 10-lbs. to the square inch or so, except in the case of certain spray guns which require the material to be under a pressure of 20 or 30-lbs. to the square inch.

Some shops use the steel drums in which the finishing material is received, for a pressure tank, spraying directly from the drum. When this is done extreme care must be taken not to put more than 8 to 10-lbs. pressure on the drum, or there will be danger of the drum bursting with a resulting loss of material and perhaps the loss of life.

When the drum is used for this purpose it should be rein-

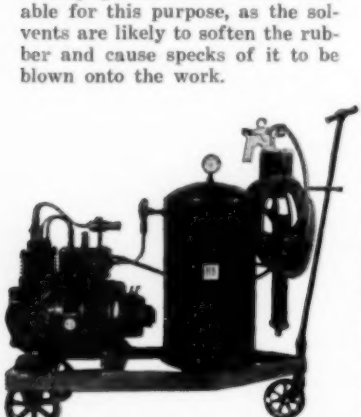


An ordinary steel shipping drum reinforced with shims, cross beams and retainer rods to make it withstand the low air pressure required when forcing material to feed to the spray gun

forced with a removable attachment to hold in the heads, and a safety valve set to go off at not more than 10-lbs. pressure should be used. Even then there is danger of the safety valve becoming clogged and allowing the pressure to go too high. It is safer either to use the gravity system or special tanks built properly to withstand as much pressure as may be on the main air line.

Use Suitable Hose

Adequate air hose and material hose are required to carry the air from the air pipe line to the gun, and to convey the material from the gravity bucket or the pressure tank to the gun. The air hose should be strongly constructed so as to withstand the maximum air pressure being used without danger of bursting. The material hose must be of special composition to resist the solvent action of the paint, varnish or lacquer. The ordinary variety garden hose is not suitable for this purpose, as the solvents are likely to soften the rubber and cause specks of it to be blown onto the work.



One of the several self-contained portable outfits.

Portable Outfits

It is possible now to obtain a complete spraying outfit consisting of air compressor, pressure tank, gun, air regulator, hose and containers all mounted on a movable truck that may be carried from one part of the shop to another. Some of these outfits are also equipped with mechanical paint removing devices for cleaning off the old paint from motor cars and similar objects.

Curtis Pneumatic Machinery Co. Issues New Catalog

The Curtis Pneumatic Machinery Co., located in St. Louis, Mo., and now in its 73rd year, is distributing a new attractive catalog which is devoted to illustrating and describing complete compressed air equipment for industrial and shop uses. Forty coated-paper pages 8½x10½-in. are bound in an attractive heavy-paper binding.

The contents include not only illustrations, specifications and descriptive matter relating to the company's products, but also instructions and much specific information regarding the selection, installation, arrangement and use of the equipment.

Pratt & Lambert, Inc., Elects New Officials

At a meeting of the Board of Directors of Pratt & Lambert, Inc., varnish, enamel and lacquer manufacturers, held at Buffalo, November 4th, the following new officers were elected: J. N. Welter, of Chicago, Chairman of the Board; A. D. Graves, Buffalo, president; H. E. Webster, Buffalo, senior vice-president; J. P. Gowing, Chicago, vice-president; W. P. Werheim, Buffalo, treasurer; R. W. Lindsay, Buffalo, assistant treasurer. Both J. B. Bouck, Jr., New York, and F. W. Robinson, Buffalo, each elected vice-president in 1924, continue in that capacity. H. E. Webster and W. P. Werheim also continue as secretary and assistant secretary, respectively.

Since the death of W. H. Andrews in 1923, the office of Chairman of the Board had been vacant, and the recent tragic death of the company's president, J. H. McNulty, caused another vacancy, thus making necessary at this time a realignment of officials.

Final article explains how to do high-lighting by, 1—wiping the wet stain, 2—sanding the dry stained surface, and 3—spraying on a new type of antiquing stain; also how to shade enameled surfaces.

Antiquing; Shading; High-Lighting—II

By Chas. Blandford

WHERE oil stains are used directly on the bare wood for antiquing, it is customary to apply the stain in the usual manner over the entire surface by the dipping, spraying or brushing method. While the surface is still wet it can be high-lighted or antiqued by wiping the stain from those parts which are to appear light on the finished work. Some skill is necessary to gradually blend in the color by the wiping method, but with a little practice the knack of doing it can be mastered.

Sometimes it is desirable to further improve the antique effect by rubbing the high lights with fine steel wool after the stain is dry. At any rate, after the proper high-light effects have been produced and the stain is dry, finishing operations can proceed in the usual manner. Any first class oil or water stains are suitable for use by this method.

Sanding the Dried Stain

If no spray is available, or if for any reason it is not desired to use other methods, it is possible to secure very similar antiqued effects by sanding the stained surface lightly after the stain is dry. This applies to either oil or water stains. This method also requires considerable skill, but of a different sort from that needed for applying the stain by spraying. In this case the trick is to remove the stain evenly and gradually, so the color blends naturally from light to dark without leaving scratches or bare places.

Very fine sandpaper must be used for this purpose, but many operators prefer No. 00 steel wool. Sometimes the stain is wiped while wet and then sanded or steel-wooled lightly after being dried.

Spraying Stain Over Filler

In many of the factories that go in strongly for quantity pro-

duction, all of the foregoing methods are too slow or otherwise unsuited to existing conditions. These establishments have adopted a more simplified practice which makes use of specially-prepared antiquing stains. These antiquing stains are of many varieties according to the sources of supply. Some of them are built along correct lines and give satisfactory results.

One of the special antiquing stains is a so-called lacquer stain, made from spirit soluble aniline dyes dissolved in denatured alcohol and added to a thin solution of clear wood lacquer to produce various shades ranging from light brown to black. Objections offered to certain stains of this type are that the spirit soluble colors have a tendency to rot the film of lacquer in which they are mixed, and that the colors are very fugitive to light and soon fade after the work is finished.

Another form of antiquing stain consists of regular spirit soluble aniline dye solutions in alcohol, or oil soluble dyes dissolved in benzole. So far as I can learn, either kind will fade considerably upon exposure to light, after having been applied to the work.

New Antiquing Stain

An entirely new type of antiquing stain has been perfected which has about all the good qualities that could be expected in one material. From the standpoint of appearance, the same results can be secured as with lacquer stains, spirit stains or oil stains, but the colors are practically non-fading.

In addition the solvents are so proportioned that this type of stain can be used over lacquer enamel, over clear wood lacquer, or over the filler. One or more coats of clear lacquer or varnish should be applied over the antiquing stain to protect it from wear after the finished article is in use.

Any of these antiquing stains are applied by spraying over the work after it has been stained, filled and dried. If the surface is not filled, they should be applied over a thin coat of shellac, sanding before applying the antiquing stain. These stains need not be sanded after being applied, except in special cases where too much stain has been put on, in which case they can be wiped off slightly over the high lights with fine steel wool after drying. The drying time is about one hour, and succeeding coats can be applied after this time.

These antiquing stains are applied by spraying with about 35 lbs. air pressure, and with the material feed adjustment on the gun cut down so the stain feeds very slowly and is split very fine. The stain should be "fogged" onto the work—not sprayed on wet. Ordinarily the stain is used full body, just as it comes from the container, unless the color is too strong, in which case it can be reduced with benzole.

Antiquing Enameled Work

All of the foregoing methods apply more particularly to natural or stained wood finishes. On enameled work, antique glazes, made from colors ground in oil or in japan reduced with turpentine, are often applied by spraying as described above, or sometimes they are applied with a sponge to get a stippled effect, or wiped with a rag. These glazes are applied after all the enamel

Vitraloid Wood Lacquer No. 2546

THE use of this cellulose lacquer by furniture manufacturers assures a fine finish and the maintenance of production schedules. And it costs no more than a good rubbing varnish.

Produces Good Body on the Work

This wood lacquer does not require any special manipulation to secure best results—just the usual handling and the work comes through with a perfect finish and on schedule time. The body on the work is exceptional for this type of material, and is the maximum that it is possible to secure with a properly balanced wood lacquer.

We would like you to know more about Vitraloid Wood Lacquer No. 2546 May we send you a generous no-charge sample to try out yourself? Write today for a testing quantity together with prices and complete information.

PRATT & LAMBERT - INC.

Manufacturers of

Varnishes Enamels Lacquers

84 Tonawanda St., Buffalo, N. Y.

New York Buffalo Chicago San Francisco

Bridgeburg, Ontario

SHERWIN-
PAINTS VARNISHES

If you want—

1. A hard, tough, but not brittle film—wear, water and weather proof;
2. A natural gloss which can be brought to high lustre with lowest labor cost;
3. Exceptional covering capacity with minimum material cost;
4. Even flow and smooth surface, free of bubbles, orange peel or blushing;
5. Fast lacquer enamel and colorless clears;
6. Uniformity of consistency, weight and shade;
7. No residual odor or toxic fumes;

You will use

OPEX

The perfected lacquer enamel

LARGEST IN

Kindly mention INDUSTRIAL FINISHING when writing advertisers

WILLIAMS
LACQUERS · ENAMELS

"Sales—
beyond all expectations"

says Wallace Pencil Co.

Manufacturers of the famous Motif Pencils

"Glossy, smooth, hard finish," and "an extraordinary blue color," are given as reasons for such swift popularity. This refers to brilliant, wear-resisting Sherwin-Williams Opex, the perfected lacquer finish.

For complete data on industrial uses of increasingly popular Opex, use the coupon. Today, learn how Opex can put greater buying urge into your product.

THE SHERWIN-WILLIAMS COMPANY
Cleveland, Ohio

The Sherwin-Williams Company, Cleveland, Ohio
Tell me more about OPEX for finishing our products.
Name .....
Address .....
City ..... State .....
40

THE WORLD

FOR METAL, WOOD, COMPOSITION, REED, ETC.

Armitage ARMORLAC LACQUER SYSTEM

A DEPENDABLE lacquer system of finishing, backed by one of the oldest paint and lacquer manufacturers in the United States.

With a background of mature experience in the development of lacquers, we number many leading industrial concerns as users of ARMORLAC, among them several well-known car manufacturers in the medium priced field.

To those who feel the urge to conquer new fields through improvement of their products, we have an interesting story to tell—of ARMORLAC, its everlasting dependability, lustrous beauty, yet on a cost basis comparable with varnish finishing.

Just give full details of your products when writing us.

JOHN L. ARMITAGE & CO.
Established 1876
Newark, New Jersey

MANUFACTURERS SINCE 1876

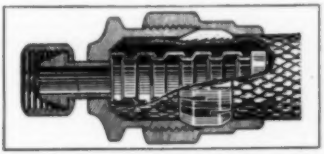
Kindly mention INDUSTRIAL FINISHING when writing advertisers

coats are dry. In some cases they are coated over with clear varnish or lacquer; at other times they are left unprotected.

The new special antiquing stains mentioned above can be used to replace these antique glazes if desired, but a coat of clear lacquer or clear varnish should be applied after the antique stain has dried about an hour.

New Coupling for Metal-lined Hose

The accompanying cut shows a sectional view of an improved coupling for use in connecting metal-lined fluid hose to spray guns, and to the fittings at outlet openings of material containers. Couplings are made to fit all standard makes of spray guns.



Part of it is broken away to show internal construction.

According to the Eastman Mfg. Co., Manitowoc, Wisc., the manufacturer, it is necessary when ordering couplings and hose for paint spray work, to give the name of the machine they are going to be used on, as the different paint spray manufacturers have adopted different threads on their machines and none of them are alike. These couplings are easily put on and can even be applied on rubber hose by putting in a standard insert.

New Brushes

A new brush should be first "broken in" by using it on some rough or priming work, then thoroughly cleaned before putting into the finishing varnish. After using, the brush should be suspended either in the material you are using or in "brush keeper varnish," a combination of raw linseed oil and finishing varnish which you can make yourself, or purchase already prepared.

All lighting devices in or near the spray booth should be protected with double glass gloves. All trouble lights, drop and extension cords should also be so equipped, in case a bulb blows out or breaks or a short occurs some way in the circuit, so that no electrical spark can escape.

Improved Metal Cap for Containers is Announced

The "Amerseal"—an improved metal cap which quickly seals and unseals with a quarter turn, and which has proved popular on glass containers—is now to be had on metal cans and boxes. The American Metal Cap Co. of Brooklyn, N. Y., the originator and owner of the Amerseal patents, has arranged with The Metal Package Corporation of New York for the sale of this seal on metal cans and packages.

The advantages of this simple and effective seal are that the consumer can quickly and easily remove the cap without any tools, and at the same time the contents can be kept fresh and perfectly sealed as long as they last, due to the fact that the cap can be securely and quickly replaced as in the original case. It can be removed and replaced as many times as desired.

Further, it permits the container to be permanently used as a container for shop purposes long after the original contents have been consumed, due to the ease with which the cap can be removed and replaced, as well as the effectiveness of the seal when sealed.

The usual raw edge is entirely eliminated.

Colors of Fashion for Finishers

Head of Duco Color Advisory Service, now in Europe studying color trends and interpreting them, finds many popular colors which will be reflected in this country next spring

By Capt. H. Ledyard Towle

PARIS—Autumn is in the air . . . . and the Automobile Salon is on. All Paris is color mad! At the Grand Palais, where the latest motor car creations stand in rows like the King's guard on parade, there are glints of burnt orange, and the dull rich warmth of maroons; taking their place in the color harmonies of the whole and giving forth a note like the muffled sound of a convent bell.

Never before such a spectacle. No longer the dead monotony of sombre hues. Here is beauty, and life and soothing satisfactions for the eye, studied from Nature herself and deliciously reproduced in endless and ever changing subtilities. The motor car is expressing at last the aesthetic ideals of its owner.

Motor Car Colors

Town cars of jade. Roadsters of cafe-au-lait and crimson. Sedans of orchid and sable. The colors of the lagoons in Venice at mid-day. The myriad golden browns and copper-reds and brown-yellows of the autumn leaves. Greens of the spring brookside and rich scarlets that vision poppies and sunsets.

Outside along the Champs Elyees the changing kaleidoscope thrills with its never-ending stream of harmonies. The haute monde and the demi monde in whirling squadrons of satisfying color rolling past upon the smooth pavements like a flashing mountain torrent at the end of a rainbow. And here and there soft punctuations of wine color and black—the Paris taxicabs, for wine color and black is proper in a Paris taxi.

The Pageant of Transportation! Here the brilliant hues worn by the crowd were like a gorgeous Spanish shawl. Gone are the gloomy simplicities of the past. All was life and color. The opera foyers, never so full of all the ravishments of sheer beauty as now, were sufficient for the artist even without the opera itself.

Color Suggestions

The President's Guard was there at attention, with their drawn sabres and gilded helmets gleaming. Inside, along the horseshoe, the boxes looked like veritable baskets of flowers hung along the walls. So filled were they with beautiful women, their gowns of orchid, peach, Rose de Versailles, Saint Germaine green, glacier or cloth of gold, being accented by the dark notes of the evening clothes worn by their escorts.

A fashion Show at the Opera. And here are some of the colors: Salmon and white, gold and blue, safe-au-lait and brown, vermilion and cream, lavender and gold, and burnt orange and gold. These were all evening dresses and manteaux.

A number of the shoes in cloth of gold or silver had high heels of vermilion or turkey red. The

A few facts about Pecora Bedstead Undercoats and Enamels

OUR Undercoats are tough and durable. The non-porous surface is a fine foundation for the Enamel Coat. We strongly recommend the use of a good undercoat as a base for good enamel.

Our enamels will not yellow—or show packing marks. They bake with an extremely high gloss—retaining their unusual elasticity.

For over sixty years we have been impartially bettering these products. Let us send you samples.

PECORA PAINT COMPANY

4th St. & Sedgley Avenue

Established 1862 by Smith Bowen — Philadelphia, Pa. — Incorporated 1911

Kindly mention INDUSTRIAL FINISHING when writing advertisers

materials were now rich and iridescent, or softly gleaming as they lay in their loose folds. So look well into your own mirror and take your choice of the colors which suit you best. I have just returned from a little color prospecting in the land of William Tell.

Yes, the Age of Color is indeed here! Now, whatever our nationality, our estate, or time of life, we can dare to express our color individuality, each in his own way; in our homes, our furniture, our automobiles and ourselves.

Filling Wood Surfaces

Filling is one of the most important operations in the wood-finishing department, because a surface properly filled gives the foundation upon which to build a satisfactory finish. When wood surfaces leave the filler room in anything short of the best condition, trouble will occur in the final finish with the possibility of a rough, uneven surface and the troublesome pinhole.

A high grade filler should be used, as very often the entire finish is ruined by the use of a so-called "cheaper" filler, which always proves to be the most expensive in the end. The filler must be applied to the work rapidly and well scrubbed into the pores. Never use a brush over the filler after it has begun to set, as this will pull the filling material from the pores instead of filling them.

If the filler is mixed by hand it is advisable to use part of the necessary amount of filler and naptha at a time, mixing well and adding filler and naptha until the desired quantity is obtained. In rubbing off the filler use a pad made of tow or sea-moss. The surface should be rubbed off across the grain with this pad, and then cleaned up with a rag, wiping with the grain. This will give a well-filled and even surface and, given the proper time to dry before putting on the following coats it will afford an excellent foundation for the finished article.—J. H. S.

Lacquer Finished Furniture

The addition of lacquers, both clear and colored, for use in the furniture industry is a great step forward, as it has almost entirely eliminated the finishing department's search for an indestructible and foolproof surface. However, it is not enough to have a satisfactory surface. Underneath must be an artistic blending of color which gives the piece of furniture the appearance of being naturally old.

This must be accomplished through the use of transparent stains mixed with a very thin lacquer, to set it quickly and to hold it in place as applied. The application is best made with the smallest possible spray gun. A competent spray operator, under the supervision of someone of artistic temperament—likely the designer—can very quickly learn to produce a beautiful shaded effect which will add many dollars in "eye value" to the physical value of the piece.

Since lacquers do not lay one coat upon the other, as do varnishes or shellacs, the stain will not have the appearance of laying on the wood, but will appear to be a part of the wood itself, and the result will be a natural, rather than an artificial-looking piece of furniture.—Clint Poffenberger.

BREVOKRAK
Offers a wide range of beautiful color combinations which greatly enhance the appearance of radio cabinets, furniture, fixtures, novelties, toys, etc.
Can also be used successfully to give the appearance of either antique or leatherette finishes, which are now so popular.
The Brevokrak "System"—for it is not merely a "krakle" finish—insures a uniform pattern at minimum cost.
Ask for full details about "The Brevokrak System"—full particulars gladly sent.
The Waukegan Chemical Co.
"Values that endure"
WAUKEGAN ILLINOIS

It does a whale of a job—this Lacquer

If men never tried anything new, this would be a stagnant world. You wouldn't be able to ride home in your car tonight, you couldn't listen to your radio, you couldn't read your evening paper—you couldn't do much of anything. It's the men that experiment who do better things—they progress.

Don't be a standpatter just because you are now using a good lacquer—perhaps there is a better one. We think there is—it's our No. 602-B. It does a whale of a job. A lot of people have tried it and used it ever since. Can your business stand the overlooking of the better things.

Invest a two-cent stamp in the possibility of a better finish for your products.

"No Tampering with Quality"

The

ROCKFORD VARNISH

Company

ROCKFORD, ILL.

Progress in Automobile Finishing

Consultant on finishing problems briefly outlines important steps of progress in automobile finishing and calls attention to the latest lacquer finishes and methods of applying them to motor car bodies

By K. N. Kathju, M. S.

TURN where we will, we cannot help admiring the progress His Majesty the Man has made in the Domain of Science; nor has he succeeded in accomplishing only the "imaginable," but has striven not a least bit unsuccessfully in achieving the "impossible" and the "unimaginable."

With the increase in the sum total of human intelligence there has been a relative increase in the demand for what we call comfort. And one of the greatest articles of comfort ever invented by the genius of man is "comfortable transportation" — the automobile.

Mass production of automobiles, fostered by a lust of power, which implies freedom, has resulted in myriads of innovations, unknown to science a decade ago. In the automotive industry the use of hair brush was akin to the sheep following the bellweather.

However, the enormous initial cost, the cost of finishing materials, the utmost care required in finishing, the uncertain degree of purity in materials and the consequent doubtful homogenity of the finished material, the unavailability of enough expert brush painters, the enormous cost of drying brushed finishes, the tediousness of operations, the need of large floor space and the consequent swelling of cost, the fugitiveness of certain colors and the short life of such finishes—these conditions were a few of the numerous causes which set the intelligensia in the paint field to thinking. The result was the heralding of "dip finishing."

Dip Finishing

The dipping process offered numerous advantages over brushing. Among the greatest of these were the saving of time, labor and material. But dipping had its own drawback too—the enormous quantity of material required in open vats and the high initial cost.

Despite these two drawbacks, the automotive industry adopted this method of painting for the smaller parts such as window mouldings, hoods, fenders, dust shields, lampposts, radiator shells and the like. A process had yet to be evolved to bring about a saving in floor space, expensive labor (brush hands) etc. The result was the flowing system.

"Flowing-on" the Finish

Until about two and a half years ago, some of the manufacturers of automobile bodies were staunch supporters of this system for all medium-priced cars, thereby effecting welcome economies in labor, material and floor space.

The installation of conveyors in connection with the flowing and dipping methods effected such great economies that the two systems were hailed as the greatest innovations of twentieth century painting.

The fact that the color varnishes and other varnishes thus used were products of oils, gums, pigments and mineral spirits, and consequently very susceptible to "the elements," brought about another interesting change—the development and use of baked enamel.

Baked Enamel Finish

Enameled finishes are baked at temperatures from 375 degrees F. up, and the resultant hard film of finish is not easily marred. Consequently smaller parts that could be easily dipped were baked at high temperatures. This resulted in further economies of time, since the drying time of 2½ hours at 150 to 200 degrees F. in cases of color varnishes and transparent varnishes, was cut down to 1½ hours at 375 to 550 degrees F. for enameling in addition to giving greater permanency to the finish. But like the rest of them, baked enameling was not without objectionable features.

The utilization of considerable quantities of wood in the construction of automobile bodies, the almost total loss of viability of such wood when subjected to temperatures not over 375 degrees F., and the absolute charring of the wood above this temperature (depending on the time) were responsible for not enameling automobile bodies for a long time. Nevertheless, two automobile manufacturers were quick to perceive the durability of baked enameled finish, and, accordingly brought about a change in body construction, namely, the replacement of wood by steel. Other manufacturers, more conservative, brought about a similar change some years later.

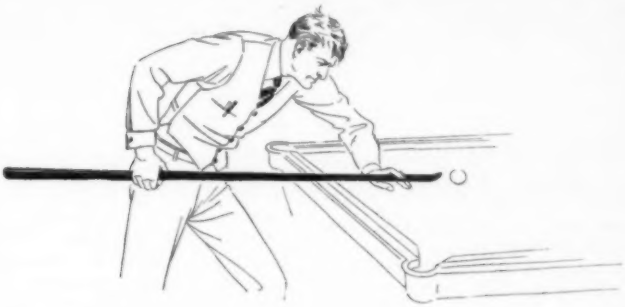
The increase in mass production of automobiles and an almost instantaneous demand for colors, necessitated the change to flowing color varnishes and forced drying of same at lower temperatures, at the sacrifice of durability.

Spraying Lacquer

Coincident with the demand for colors came the announcement of cellulose nitrate (pyroxylin lacquer) as an automobile finish. The new material, unlike paints, varnishes and enamels, could not be very well applied by any of the conventional methods, such as brushing, dipping or flowing. It had to be put on with the air brush, nicknamed "spray-gun," because of its resemblance to a revolver.

Whereas, paints, varnishes and enamels, are oil products, their drying depends chiefly on the oxidation of oils through the absorption of oxygen, fostered by catalytic agents known as driers. The new lacquers, on the other hand, being solutions of cellulose nitrates in such commercial solvents as amyl acetate, butyl acetate, butyl alcohol, butyl propionate, toluol, etc., they must be spread by an air-brush so as to lay in an even film of cellulose nitrates on the surfaces being finished. Rapid evaporation of the solvents completes the work.

However, this rapid evaporation has had its own drawbacks because lacquers could not be brushed, and the cellulose nitrate material (generally called pyroxylin and signifying the same material as is sold under several trade names) had to be laid on the surface to be finished by the atomization of the material through an air brush. The material thus sprayed is laid very evenly on the surface to be fin-



Shooting a game of Kelly-pool with a crowbar . . . . . .

YOU wouldn't shoot a game of Kelly pool with a crowbar, nor try to move a boulder with a billiard cue.

Yet each is a perfect instrument, *in its place*—for its own particular work.

It's the same with finishes. Many finishes are good, but mere quality is not enough. Unless the finish is adapted scientifically to the particular surface it is to cover, it cannot give best results.

This matter is of such vital importance that the du Pont Company has put at the disposal of all manufacturers its Industrial Finishing Service.

Backed by the experience and resources of the du Pont technical and laboratory staff, these trained finishing engineers choose scientifically the proper finish—and the proper finishing system—for each particular finishing job.

For information regarding the du Pont Industrial Finishing Service, and other information about the du Pont line, write to E. I. du Pont de Nemours & Co., Inc., Parlin, N. J., Chicago, Ill., San Francisco, Cal., Everett, Mass., or Flint Paint & Varnish Limited, Toronto, Canada.

DU PONT

ished. It is interesting to note that the drying time of many pyroxylin finishes is 5 minutes or a trifle more at the room temperature (depending on the nature of the solvents) as compared to 24 hours and more for varnishes at similar temperature.

Despite the cost of equipment and the cost of raw products, pyroxylin lacquer finishes are almost universally used for automobile finishing, because they are the cheapest in the long run, and the most durable.

Advantages of Lacquer

Some of the factors of economy in the use of pyroxylin lacquers are the enormous savings in time, labor, and in finish repairs; also the ease with which pyroxylin lacquers can be used and, last though not least, the fact that a high grade pyroxylin lacquer finish is unaffected by heat or cold, rain or shine, alkalies and greases, etc. It cannot be easily marred or scratched; in fact rubbing and polishing only increase the degree of luster.

Of course, the use of pyroxylin lacquer finishes calls for a considerable initial cost of equipment, not to mention the amount of material lost in the air. I have figures to show that a large percentage of the material sprayed on the car body is lost permanently by evaporation because of the volatility of its ingredients. A certain percentage of the solid material which is supposed to finish the body is lost in spray booths and louvers.

Despite the amazing loss of material which costs from $1.35 to $2.00 a gallon, the cost of automobile finishing has been reduced at least 30 to 40 percent in large automobile plants, through economies briefly enumerated above. Should it be possible, however, to recover 90 percent of the sprayed material that is lost in the air, the economies would be of remarkable importance to the industry.

Brushing Lacquer

Because of the great initial cost and the rapid evaporation of the pyroxylin solvents, which make brushing impossible, the pyroxylin chemists and formulators, have developed "brushing lacquers." Such pyroxylin lacquers are a great aid in two-tone finishing, since, masking is practically done away with in cutting mouldings, etc. The brushing lacquers are here to stay, but they will never supplant spraying in the automotive industry.

Dipping Lacquer.

The chemists of a certain concern in the east have developed a dipping lacquer for use on fenders, dust shields, window mouldings, etc. Several automobile manufacturers are experimenting with dipping lacquers, and one well-known manufacturer has actually adopted this material as a standard for finishing fenders, hoods, etc.

Flowing Lacquer

In the process of evolution the finish chemist has gone round and round. History repeats itself and today, certain manufacturers are feverishly working with a lacquer that can be flowed on automobile bodies. Flowing lacquer is an accomplished fact and is now being used by a certain Detroit automobile manufacturer.

The flowing lacquer presents a departure from the conventional types of spraying lacquers on account of the total absence of gums in the latter. It consists of half-

Invite us to show you

Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

second cellulose nitrate, an oxidized oil, a high boiler (an ester), a compound plasticizer, wood turpentine and pigment.

When flowed on automobile bodies the material spreads out perfectly, has good hiding powers, produces a smooth film, shows no "orange peel" surface and does not bloom. Its use cuts down sanding expenses to a minimum, and it is claimed to be equal if not superior to any spraying lacquer.

Flowing lacquer air-dries in an hour and a half at room temperature, or it can be force dried at 200 degrees F. for 20 minutes in an atmosphere rich in humidity. It produces a glossy finish, comparable to the best varnish finishes. The flowing lacquer may also be applied with spray gun and, because of high boilers and oxidized oils, it flows evenly without leaving any pitted or orange peel effect.

Striping—For the Beginner

An expert striper of 25 years' experience points out what requirements and what equipment are needed for skillful striping, which is so much in demand today on automobiles, furniture, toys and other articles

By Fred Mannhardt

STRIPING is an art that can only be mastered by much painstaking practice and patience. Stripers as a rule are born, not made. A steady nerve and a good eye are essential. Lacking in these, a man is simply wasting his time to try to learn striping.

There are several methods of striping for which the three most commonly used brushes are the "broad liner," the "sword" and the "square shader" or pencil. Good striping colors can be obtained at any good paint store or from advertisers in this journal.

A heavy plate glass pallet, preferably about 6x10-in. in size, is as good as anything to use, as it will not slide around when a man is working out his brush.

Uses of Different Brushes

The broad liner is a long round camel's hair brush, generally used to make stripes more than ⅛-in. in width. For practice work, fill the brush by dipping it in the stripe color; work the brush out on the pallet, laying brush almost flat and using zigzag motion. Grasp the brush handle between thumb and forefinger and about half an inch above the hair.

Use a smoothly planed piece of finished board with a straight edge as a guide for the fingers. As you draw your stripe, gradually lower the brush, so as to make the stripe uniform in width. This is necessary, as what paint you can get on the end of a brush will not carry very far.

The sword brush is a long flat brush, cut off diagonally at the end, and is used for lines from the size of a hair up to about ⅛-in. This brush should be filled, or loaded the same as the broad

"If you could ask manufacturers who use Murphy varnishes and finishes on furniture, pianos, automobiles and other things, if you could talk to architects who specify Murphy finishes, and master painters who use them, you would find that all have a certain confidence in the name Murphy. This confidence is what constitutes the Murphy reputation. Murphy Varnish people are determined, come what will, they will never put out a product that lessens their claim to that reputation."

A NEW Pyroxylin Undercoat For Lacquer

Murphy Kauriol Wood Preparation is a patented pyroxylin undercoat possessing unique qualities which must give it an important place in every wood finishing shop.

It performs the triple function of staining, filling and waterproofing new wood in one application. Since it does not raise the grain sanding is eliminated. Thus in one operation you advance the work of finishing as far as with three operations under ordinary procedure, with a corresponding saving of time, labor and storage space.

Murphy Kauriol Wood Preparation is brushed on like an ordinary filler. In twenty minutes it is wiped off across the grain. That is all. Murphy Kauriol Wood Preparation dries over night and the job is then ready for the finishing coat of varnish, lacquer or wax.

Let us send a man to demonstrate how Murphy Kauriol Wood Preparation will save time and cut finishing costs in your plant.

Murphy
KAURIOL Wood Preparation

MURPHY VARNISH COMPANY
NEWARK · CHICAGO · SAN FRANCISCO · MONTREAL

liner. Start with point of brush and as you proceed, gradually lower it until the paint gives out.

The square shader, or pencil is a round brush like the broad liner, only much smaller, a handy size being about ¾-in. long and as thick as an ordinary parlor match. This brush is properly held, much as you would hold a lead pencil, only vertical, and it is used mainly in sign painting and for striping small circular articles, scrolls, etc., where a longer brush like the broad liner or sword would side swipe. The extreme tip of this brush is used in striping plain lines, using the fingers as guides against a straight edge.

For making scrolls, etc., rest your brush hand on the other hand. This enables you to get an easy, graceful swing with the brush. However, I would advise a beginner to first learn to make straight lines, which in my opinion are the hardest lines to draw. More can be said about using the square shader, or pencil, but that would run into lettering and since this is a striping article, I will confine myself to the one subject at this time.

Practice on Parallel Lines

For beginners I would not advise drawing a line either by rule or compass to stripe over, as following a line, which necessarily will be partly hidden by your hand, is more of a professional practice for the purpose of keeping distances and making stripes as near mechanically perfect as possible. Rather, I would advise drawing a line with pencil or compass, about one inch from the right hand side of the board to be striped, in practice work. Then try to draw a line alongside it and continue with more lines, spacing them about ⅛-in. apart. See how near you can come to keeping the lines parallel. Care must be taken in loading the brush to keep the striping color tacky or sticky enough to hold the hairs of your brush together.

When the color gets too pasty —as it will at times—dip your brush in turpentine, and "work out" in color on pallette, to proper consistency.

Care of Brushes

When you are through striping, wash the brushes in turpentine, being sure to get them thoroughly clean, especially at the hilts or near the handles. Otherwise, color dries in the brush bristles and the hairs will break off. After washing a brush, dry it with a rag; dip it in lard oil and lay it away in a clean place, preferably on a piece of glass. When you want to use your brushes again, wash out the lard oil in turpentine, dry each brush with a rag, and proceed as before.

Note to Editor: This is in response to your very nice letter of the 15th of November. If you desire any further information or if any of your subscribers do, I will be pleased to help. I cover a number of trades in your line—signs, baked enameling, auto decorating, etc. Thanking you for your very courteous treatment, I am, sincerely yours—Fred Mannhardt.

Lacquer or pyroxylin enamel has a nitro-cellulose base, which is cotton, purified and nitrated. The other component parts required to produce a finishing compound are gums, oils, softeners, stabilizers, solvents and pigments. When these ingredients are properly mixed, they dry quickly in the air by evaporation of the solvent and leave a film that is hard and tough.

MARIETTA Varnitro
COMBINING SPEED & QUALITY
IN A PRACTICAL VARNISH PRODUCT
(PATENT APPLIED FOR)

Is Not a Lacquer

Varnitro possesses a few lacquer characteristics such as speed in drying and unusual toughness. But—

It Contains the Same Amount of Oil as a Rubbing and Polishing Varnish

IT IS NEW

IT IS YEARS AHEAD

TRY IT AND FIND OUT FOR YOURSELF

THE MARIETTA PAINT & COLOR COMPANY

Executive Office and Factory: Marietta, Ohio

Southern Factory: High Point, N. C.

Use this coupon please.

Marietta Paint & Color Co., Marietta, Ohio.

We are interested in Varnitro.....gloss, ...dull. Please ship.....gallons at drum price—also panel.

Company.....

Address.....

Dec. I. F.

Finishing Hobby Horses

Describing problems, requirements, materials, equipment and methods involved and used in the finishing department of the world's largest hobby horse factory

By A. J. Daniels

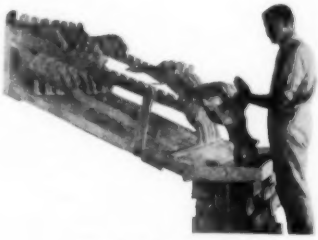
IT WAS Hector, I think who built the first wooden horse of which history has any record. From all accounts it was a tremendous success, but it is really too bad that no master painter was present to jot down the formula with which it was finished. The equine was so attractive that the Trojans immediately fell for it. A finish like that would be worth several times its weight in gold to the toy makers of today.

Since the days of Hector, no toy has proved so attractive to the children as the toy hobby horse. And it is no secret among toy makers that the attractiveness lies in the finish. In the factory of which I have charge of the finishing of all toys, I find more difficulty in securing a "just-right" finish on hobby horses than on any other toy. We average in production from 100,000 to 150,000 horses of various sizes a year.

In the course of 20 years we have worked out some short-cut processes that are of immense help, but difficulties still crop up. In that space of time I suppose we have encountered about every form of paint and varnish trouble there is, but generally a study of the problem, with perhaps some help from the laboratories of the manufacturers, will indicate the way out.

Dapple Gray Favored

Practically all of the hobby horses found on the market today are finished in dapple gray. For some reason or other bay horses or black horses with white blazed faces fail to appeal. We have tried both, and many other colors, but the dapple gray still remains the favorite. So we have abandoned all other colors and concentrated on the dapple gray. The base of the finish on a toy horse is applied in the mill room. It may seem strange but the real finish starts at the belt sanders, and everything else depends upon the job done on these machines.



Dipping hobby horses.

We use two big belt sanders which take a foot wide and oscilating all the time. In addition we sand by hand the parts that even the most flexible sander cannot reach. Lumps of glue are scraped off with a chisel and the horse bodies, which of course are sanded after being shaped on the lathes go to the finishing room as smooth as they can possibly be made.

SHARPLES TRADE MARK SOLVENTS

PENTASOL

PURE AMYL ALCOHOL

SPECIFICATIONS

Acidity	Neutral
Ester Content	None
Hydrocarbon Content	None
Water Content	None
Color	Water White
Sp. Gr.	.815 at 20°/20°/C
Distillation Range	112°C to 138°C

No residual odor

No "heads" no "tails"

THE SHARPLES SOLVENTS CORPORATION
Sharples Bldg., 23rd & Westmoreland Sts.
PHILADELPHIA

Sizing and Puttying

As all horse bodies are made of white pine and since, as I said before, we use the dapple finish entirely, it is obvious that some sort of sizing coat must be employed to prevent the pitch from turning the paint yellow.

Twenty years of experimentation brought us back to the starting point, namely, glue size.

We tried shellac, imitation shellac, water glass and various prepared sizes. Finally we decided upon the old glue size—5-lbs. of dry glue to two gallons of water, boiled and kept warm. We apply the size with a brush and, if the work is properly done, we have very little trouble with any raising of the grain.

After sizing the surface, it is necessary to putty all small holes, checks and cracks. Ordinary oil putty would be useless as it would take too long to harden and would show through the paint if not colored beforehand. We have devised a putty that I have never seen used anywhere else, and it works perfectly.

We mix a pound of dry glue with a pound of whiting and then cook the mixture in a glue kettle with about a gallon of water. The putty is applied plentifully and after drying, which takes about half an hour, the surplus is easily scraped off with coarse sandpaper. This same putty, by the way, has great adhesive properties; we use it to glue the glass eyes of the horses into the sockets.

The Priming Coat

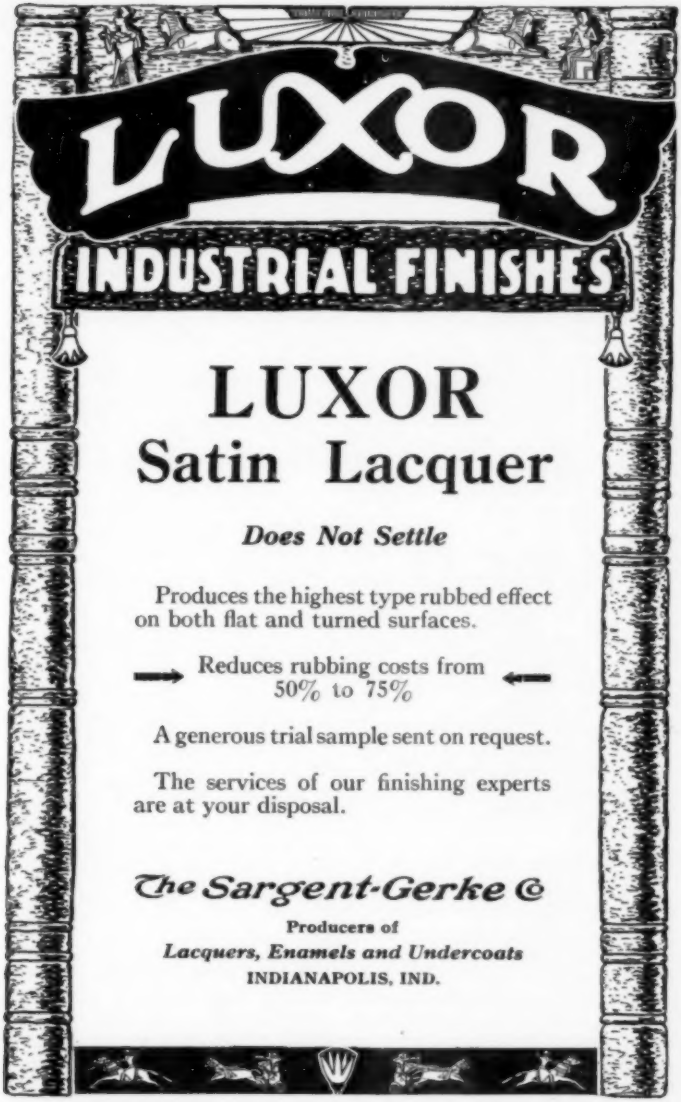
When the sizing coat and the putty applications are dry, the horses receive a coat of heavy primer. When I say heavy primer, I mean just that. There is no cheaper way of applying a primer coat to an uneven surface than by dipping. This primer coat is composed of a minimum of lead, some zinc, some whiting and some lithopone. We grind it ourselves and we use benzine as a thinner. If there is a cheaper first coat material to be found anywhere, I would like very much to find it. Understand, I mean a first coat that will cover as this does, drip without sags, and dry in two to three hours in an ordinary room.

Making the dapple effect with spray gun to which is attached the material cup.

For dipping we have a special tank with a rack extending out of it and over an apron. The dipper has a boy helper who takes the horse after it is immersed in the tank and places it in the rack farthest from the tank. The rack holds 24 horses, and when the last one has been placed on the rack the first one is dry enough to be transferred to another rack in the back of the room. By the time a dipper has dipped a lot of 200 horses, the first ones dipped are ready for the second coat.

The Enamel Coat

This second coat—an enamel—is brushed on. Here we have tried spraying machines but have never been able to quite equal the time or the results obtained by our method of brush-



LUXOR
Satin Lacquer

Does Not Settle

Produces the highest type rubbed effect on both flat and turned surfaces.

Reduces rubbing costs from 50% to 75%

A generous trial sample sent on request.

The services of our finishing experts are at your disposal.

The Sargent-Gerke Co

Producers of
Lacquers, Enamels and Undercoats
INDIANAPOLIS, IND.

ing. We use the very best enamel we can buy and find that most first grade enamels of standard brands work equally well.

A stunt we use in this work is to keep the enamel cans in special dishes of hot water while in use. We find that if the enamel is kept a little above the temperature of the room it flows much more freely.

The enamel coat is allowed to dry four hours. By that time it is just tacky enough to take the dapple coat. Here is where the real art and the real difficult part of finishing the horse comes in. For years, even in Germany where efficiency reached its zenith before the war, all horses were dappled with a brush. The painter would first take a big round brush, about size 9, and prepare it by cutting out the bristles in the middle, and inserting a large cork. The remaining bristles formed a ring around the cork. Working slowly and using dry lamp-black the painter would place the dapples on the tacky enamel. This method was terribly slow. The brush-made dapples were almost exactly uniform, and, when finished, the horse resembled a futurist portrait, all covered with uniform black circles. No real horse ever boasted such perfect dapples.

Dappling With Air

The small air brush used with a can attached directly to the gun, provided us with the first real uptodate method of dappling a horse as he should be dappled. Of course, a great deal depends upon the skill of the painter, but we find that if a man has any ability at all he can acquire the necessary skill within a week or ten days.

The painters place the horse bodies on small revolving pedestals in hooded enclosures. Beginning at the head they work backward, all the time keeping the gun turning in small circles. The nozzle of the gun must be kept about 18-in. from the horse, and the painter must move fairly fast to prevent blotching.

The dappling mixture we use is composed of an ounce of lampblack to a quart of benzine. The force of the air drives the black into the tacky enamel and leaves a perfectly smooth gray surface where it touches. The dappled horses are then placed on long racks where the painters can walk in front of and back of them. The hoofs are next blacked. Our painters use a mixture of drop black and varnish for this purpose. They apply it with a small camel's hair brush, starting at the rear of the hoof and completely covering it with one sweep.

Final Touches

The eyes on the cheaper horses are painted. Here again, the painters have originated a method of their own. Using a small piece of tin as a palette, the painter will mix up a small quantity of lampblack and varnish. He mixes it very thick and, using the ball of his thumb as a brush, he is able to produce real lifelike eyes. Each painter carries with him a small quill hair-line brush. After "spotting" the eyes he draws the eyebrow around it with the small brush.

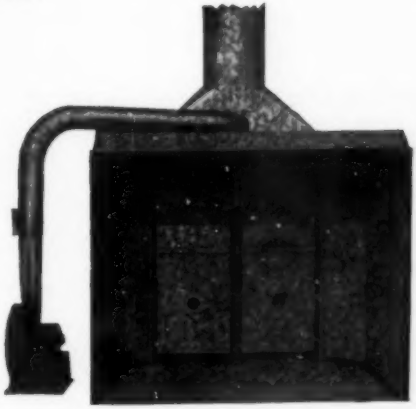
The insides of the horses' mouths and nostrils are then painted red. The men use a small brush and a mixture of devil's red and varnish for this purpose. After the red insides of the nostrils have dried, the

"Eliminate a Fire Risk"

NEWCOMB

SYPHON VENTILATED CABINET

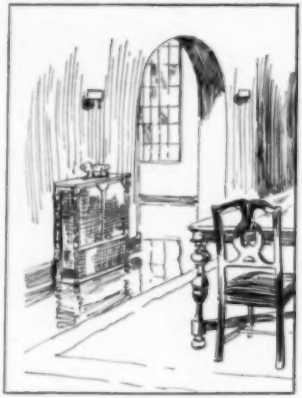
THE "NEWCOMB" GIVES YOU everything you could want in a spraying cabinet and much more than you had thought possible.



Let us tell you about our latest and best development; the fan with direct connected motor, independent of booth, with rear of booth fitted with reclaiming chamber and baffle-doors.

Grand Rapids Blow Pipe and Dust Arrester Company

Dust Collecting Systems 527 Monroe Ave. Grand Rapids, Michigan



Finished with Egyptian Lacquer

THE Kauffman Radiator Shield, here illustrated, is shown through the courtesy of the manufacturer, the American Metal Products Corporation of St. Louis.

This article is finished with Egyptian Lacquer as is the entire production of the American Metal Products Corporation.

This is but one of thousands of manufacturers who are employing Egyptian Lacquers on all or part of their production.

The Egyptian Lacqu

90 West Street, Ne

Chicago **Los Angeles**

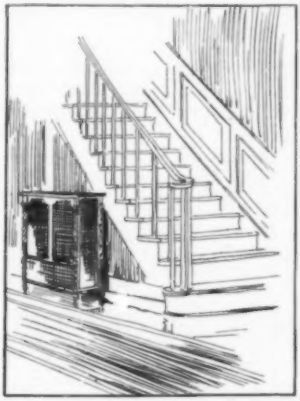
EGYPTI
Lacquer

Egyptian Lacquers

FOR fifty years Egyptian Lacquers have been known to and used by the Industrial finishing field.

There are numberless firms, outstanding in the nation's industry that have used Egyptian upwards of thirty years.

Surely the continued use of a product over a period of years is sufficient evidence of its dependability.



an Lacquer Mfg. Co.
t Street, New York
Los Angeles **San Francisco**

YPTIAN
acquers

BEST by TEST
The Spraco Lacquer Gun

SPRACO
14-A Gun

Bought on Performance

There is but one real test of a Spray Gun and that is its effectiveness in operation. Nothing else really counts.

The **SPRACO Gun** has stood that test many times. The "show-me" man is always welcome. One of these, whom we recently met, took several weeks to learn about the SPRACO Gun through exhaustive tests in production and he has since bought hundreds of them. We will give you his name and address if you desire it.

Meet us on his basis of buying and we believe your judgment will agree with his. You can start an investigation by writing today for our bulletin 103.

SPRACO PAINTING EQUIPMENT COMPANY
60 HIGH STREET -- BOSTON, MASS.
Sales and Service Stations
New York - Atlanta - Cleveland - Detroit - Chicago

outer black rims are painted on with the same mixture used for the eyes. We formerly painted manes on some of our horses, but we have discontinued this excepting for special orders. Most of the horses are shipped with real hair manes made of calfs' tails.

After the trimming has been applied to the horse, it is allowed to dry over night. The enamel, of course, is still tacky after the hoofs and eyes are painted, and the combinations used for dappling and reddening the mouths and nostrils will dry just about as quickly as the enamel. We do not use a dry kiln, since by using fairly quick-drying materials, we find that we can put the horses through about as fast as we could with a kiln.

We never have "yellows", we are entirely free from blistering and peeling troubles, and we save a lot of handling. Of course, the horses have to be racked until dry, but they nest very closely after they are dry and we do not have to wheel them in and out on trucks, as would be the case if we used kilns.

Foreman Gets Credit

A dipping tank, a spray gun, a few brushes and a fair collection of brains in the paint room are all we ask. Our paint room foreman is a jewel and deserves full credit for most of the time-saving processes in use in our horse-finishing department. We have found that it pays to stand back of him in experimenting, and to try out the things he wants tried out.

The main task, of course, is to produce a finish that will pass the test of the New York buyers, many of whom I am convinced would not recognize a real horse if one should bite them on the leg. But until some one digs up the formula used to finish the horse that fooled all Troy we will, I presume, have to continue to use the finish that pleases (and fools?) New York.

All compressed-air lines contain condensed oil and water vapor, both of which are detrimental to good air-brush work. The oil and water separator is a device which, when connected in the air line between the air compressor and the air brush, filters out all moisture and dirt. Each branch taken from the main air line should be equipped with such a device to insure clean air reaching the brush.

Du Pont Issues New Book

"Architectural Specifications" is the subject of a new book published by the Architectural Division of the E. I. du Pont de Nemours & Co., Philadelphia. This book is planned as a service to architects and specification writers, and is arranged to conform with the plans recommended by the American Institute of Architects for filing specifications and descriptive data on paint and varnish products.

The book contains complete specifications and descriptions of all du Pont paint and varnish products of interest to architects, including Duco, house paint, metal paint, shingle stains, flat wall paints, floor paint, enamels and wood finishes. Color sheets are included in each classification showing the line of du Pont finishes.

The book is being distributed exclusively to members of the architectural profession.

LACQUERS for Wood

Pioneers in wood lacquers that give a finish that lasts. Made to satisfy users for sixty-nine years. Write us your requirements.

Chas. Cooper & Co.
90 Worth St., New York
Works—Newark, N. J. Since 1857

Industrial Finishing

PRACTICAL PUBLICATIONS, Inc.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

DECEMBER, 1926

Finishing Foremen Assume Role of Artists

The rapid advancement, which has come about in the last two or three years, in the quality and appearance of furniture, has put the finishing department to a severe test in its efforts to keep pace with the accomplishments of the designers. Chief among the problems has been the proper handling and blending of colors made necessary because of the recent idea of using a great variety of woods.

The finshing foreman is consequently obliged to assume the role of an artist in addition to his other duties, and it is impossible to give too much attention to this matter, as there is no limit to the extent to which the finishing department can add to the beauty and value of well-designed furniture.

Each new piece, as it comes to the finishing department, offers an opportunity for testing the artistic ability of those responsible for the finish, and too much effort toward obtaining the best possible results cannot be used. Since the finishing department is the last to handle the piece, it is of tremendous importance that the finishers' work be well done. In so doing they will add greatly to the value of their company's product and to the industry in general.

Finishing Departments for Millwork Factories

It is a matter of interest and significance to note that an increasing number of millwork manufacturers either have installed or are now planning the installation of equipment for completely finishing a certain percentage of the product they manufacture and fabricate on special orders. This step has been forced upon many millwork concerns in order to satisfy the demands of customers who insist that the interior woodwork they order be finished at the factory, so that the building or rooms in which it is to be placed will be ready for occupancy immediately after the woodwork is installed.

This finishing of the woodwork at the factory is another of those things that contribute materially to the speed with which present-day building projects, alterations, etc., can be rushed to completion, so that capital need not be tied up so long without returns on the investment.

Building construction today is planned and designed to proceed on more of a precision basis than heretofore, and as a result a large portion of the interior woodwork can be completely machined and fabricated at mills before delivery to the job. It is made to fit and, when delivered to the job, all that remains to be done is for skilled workmen to fasten it into place just as they do with polished marble, terra cotta and finished metal work.

With the interior woodwork completely made up at the mill, so it is ready to fit the space which it is to occupy, there is no longer a reasonable excuse for delivering it in the white and thereby permitting it to be soiled during handling and to take on moisture and swell in an unheated building where doors and perhaps windows must be open while the final work is in progress.

Lacquer Production Increases

The Department of Commerce announces that, according to data collected at the latest semi-annual canvass of paint and varnish manufacturers, there were produced during the six months period from January 1 to June 30, 1926, 209,022,800-lbs. of paste paints, comprising 129,343,800-lbs. of pure white lead in oil, 11,634,300-lbs. of combination or graded whites, 3,502,500-lbs. of zinc oxide in oil, and 64,542,200-lbs. of other paste paints; 45,402,100 gallons of ready-mixed and semi-paste paints, including enamels; 38,081,400 gallons of varnishes, japans and lacquers, other than pyroxylin; and 10,136,800 gallons of pyroxylin (nitro-cellulose) varnishes or lacquers.

The statistics for the first half of 1926 as compared with those for the second half of 1925 show decreases of 6.8 percent and 3.9 percent, respectively, for paste paints and ready-mixed and semi-paste paints, an increase of 10.7 percent for varnishes, japans and lacquers, other than pyroxylin, and an increase of 62.9 percent for pyroxylin varnishes and lacquers.

The statistics are based upon the returns from 549 establishments, of which 79 reported the manufacture of pure white lead in oil; 159 combination or graded whites; 131, zinc oxide in oil; 324, other paste paints; 443, ready-mixed and semi-paste paints; 344, varnishes, japans and lacquers, other than pyroxylin; and 111, pyroxylin varnishes or lacquers.

No data are included for 32 establishments which reported for the second half of 1925, but not for the first half of 1926. These establishments reported, for the second half of 1925, seven-tenths of 1 percent of the total quantity of paste paints, 4.9 percent of the ready-mixed and semi-paste paints, 4 percent of the varnishes, japans and lacquers, other than pyroxylin, and 1 percent of the pyroxylin varnishes or lacquers.

Dealing with Defects

Notwithstanding the improved machine equipment for working woods and metals, and improved priming, surfacing and finishing materials for covering these surfaces, defects still occur which must be treated to make the final jobs presentable. The chipping out of cross grain in wood, and deep scratches or scars on metal surfaces, are often passed on to the finishing department for fixing. In other cases, surfaces are marred while the articles are being transferred to or handled in the finishing room.

Formerly, many experienced foremen finishers had their own secret formulas for making plastic materials with which to fill out and smooth over such depressions, but today improved materials are on the market and available to every one in need of them. Not only do these manufactured plastic materials fill all the require-

ments as to sticking, drying and hardening without shrinking and without affecting unfavorably any finished coats applied over them, but they are available in any tint or shade of color desired to match the surface being repaired, or the finish it is to take.

As for faults or damage occurring during or after the finishing process, there are manufacturers today who offer materials, service and methods for dealing effectively and economically with every difficulty or trouble that may arise. Even after an article finished in varnish has been delivered and placed in service for several months, or even for years, where conditions are so unfavorable that the finish cracks, it is possible with present methods to treat the cracked surface and restore its original smooth lustrous finish, without removing the original varnish.

Materials of the character that enable ordinary finishers to deal effectively with defects, faults and damaged surfaces, probably will always continue to be in demand in industry. At any rate, they are much in demand today, as is evidenced by the number of inquiries which come into this office.

Care of Brushes

Brushes in daily use may be kept suspended over night in the pot of varnish being used, which should be covered.

Brushes in frequent, though not daily use, may be kept in good condition in a liquid consisting of one-half raw linseed oil and one-half turpentine.

While the brush is full of the varnish being used, suspend it in the liquid deeply enough to cover the hair, or bristles. Wash it out thoroughly with turpentine before using. Change liquid every month or two.

Brushes that are used only occasionally should be washed in turpentine immediately after use, shaken out, dried and wrapped in oiled paper to keep them clean.

Brushes in which the varnish has hardened can be softened by soaking them in varnish remover several days, after which wash them in turpentine. They can then be used for ordinary work. —M. H. J.

Treating Insides of Furnace Pipes

The soot in furnace and range pipes is impregnated with sulphur dioxide (SO_2). Summer dampness combines with this to form sulphuric acid (H_2SO_4) which slowly but persistently eats holes in the metal.

After this winter's service take the pipes down, brush them out thoroughly, and apply one thin coat of a good grade of black enamel to preserve them. Store them in an upright position in a dry place—preferably the attic —and they will be in condition to set in place when needed in the fall.—J. H. M.

When the spraying outfit is to be inactive for a few days the fluid hose at the spray booth should be thoroughly washed out with solvent, and blown out with air pressure to dry. If, however, the outfit is to be inactive only a few hours, the fluid may be left in the tank and hose, provided the latter is connected to the spray gun, to prevent air getting into the hose and causing hardening of the fluid.

CURTIS COMPRESSORS. HOISTS. CRANES. CAR WASH SYSTEMS. PORTABLE COMPRESSOR UNITS

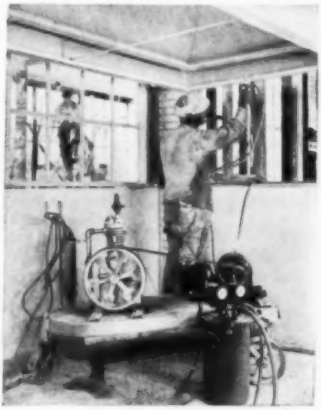
You Cannot Go Half Way

Spray painting with lacquer and quick drying paints and varnishes admits no halfway measures. Primers, fillers and finishes must be sprayed properly, as every user knows, to insure a satisfactory job.

Leading paint spray machine manufacturers everywhere have found that the air compressor is a most important factor in securing best results in spray painting. The selection of the Curtis as the standard compressor has been a natural course because no other compressor embodies the many features and advantages that make it distinctly adapted for spray painting.

The Curtis controlled splash lubricating system is an exclusive patented feature that prevents excess oil getting into the oil lines and eventually clogging up the air drier and filter with consequent ruination of the lacquer, paint or varnish job.

Add to this 72 years of successful manufacturing and 29 years experience in building compressors and you have the answer for the superiority of Curtis design, construction, reliability and inherent quality.



CURTIS Pneumatic Machinery Co.
1977 Kienlen Ave., St. Louis, Mo.
8518D Hudson Terminal, New York
Please send information about Spray Painting
Name.....
Address.....

CURTIS COMPRESSORS

CURTIS PNEUMATIC MACHINERY COMPANY, ST. LOUIS, U.S.A.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

A time study analysis that revealed startling facts

Costs in the Finishing Room—II

Explaining a typical example of how time studies were taken, how operations were analyzed and how piece rates were set in the finishing department of a woodworking factory

By E. F. Werner

HERE I will take occasion to describe how time studies were made and piece rates established in the finishing room of a typical woodworking factory.

In order to get at a fair piece price, time studies were made to determine the operations. No attempt was made to go into every small detail or operation, because it would be too elaborate for the shop in question, and it was seriously doubted if a complex system would stand up.

Selection of Man and Job

The man selected for the test was a good average mechanic, one always willing to co-operate. The reason for the study was explained to him. He was also told that his daily wages would be guaranteed for the period of the run and that, in all probability, he would average more than his regular wages. He was instructed to work at his normal speed, to get a drink or go to the washroom whenever he needed to, just as he would under normal circumstances.

Where the Time Goes

The test was made on a lot of goods which were often made. The figures for certain work, done under ordinary day-work conditions, showed a total time of 3¼ hours. A detailed study of the sub-operations was made first, just to observe the preliminaries the man went through before actually starting on the work. The list is as follows:

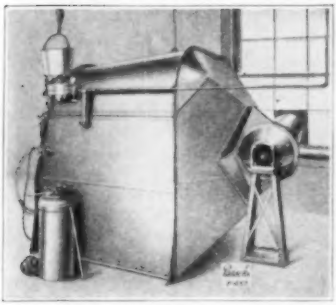
1. Read work ticket.
2. Fill reserve can with lacquer.
3. Shake can.
4. Go over gun, cleaning certain parts.
5. Testing gun and making adjustments.
6. Dust material to be finished.
7. Spray several pieces.
8. Readjust gun.
9. Spray some more pieces.

The above operations were repeated a number of times, in addition to leaving the booth seven different times during the period of the test run. These periods ranged from 2 to 11 minutes, the latter when the operator took care of his personal needs. The other occasions were to see foremen, to check work, get additional material, and once, just to talk to another operator, the total time away from the work being 38 minutes.

A stop watch was then used to determine the actual time spent in spraying, the actual time needed in preparing the work and material, and the time not actually in production. The result was surprising, inasmuch as the actual time spent in spraying was one hour and four minutes; preparation, 47 minutes, and unnecessary time was one hour and 14 minutes.

Paasche LEADS

in most complete and Highly Perfected Spraying Equipment



MOST any spray finishing outfit is so much better than brushing that it is not surprising to find finishing departments content with inferior equipment.

Developments in spray finishing have come rapidly. This organization devotes its energies exclusively to such equipment. Naturally, important improvements are frequent.

You are too busy with your own problems to keep informed on such developments. But be *sure* you have the spray finishing equipment best suited to your needs.

When you get it, your two big problems—more production and better quality—won't trouble you.

Comparison is the only proof of quality in finishing equipment. Paasche equipment is superior—most economical—and has no equal.

Patented Exclusive Features

1. Cabinet admits most daylight to work. Ventilates and cleans easiest. Equally efficient with or without baffles. Each baffle removes separately and is held tight without bolting. Four 90 degree turns collect most materials with least friction.
2. Patented exhaust unit moves more air per horsepower. Direct connected—no friction from belt, chain or bearings—fan screws off and on and is easy to clean.
3. Patented air conditioning unit removes all moisture. Keeps itself clean automatically. Needs no repacking.
4. Patented pressure feed tank is simplest, lightest and most efficient. Cover removed in five seconds by one turn of crank handle. No bolts, nuts or bars to fuss with.
5. Patented universal type Multiplehead spraying device covers the widest working range, most complete, simplest, strongest and most economical.

Paasche Airbrush Co.

1921 DIVERSEY PARKWAY, CHICAGO

New York
54 Dey St.

Detroit, Mich.
11-237 General Motors Bldg.

Cleveland, O.
418 Perry Payne Bldg.

Los Angeles, Calif.—411 Douglas Bldg.

IF12–Gray

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Setting the Rate

The operator could not believe the amount spent in preparation and unnecessary waste until the actual figures were shown him. The rate was then set for the job, allowing for spraying, 64 minutes; preparation, 20 minutes, extra allowance, 20 minutes, giving a total time of one hour and 44 minutes, as against a previous record of 3¼ hours. The rate was so set that if the man finished the work in the time set, he made as much as he previously did on the 3¼ hour schedule, but if he did not he got less. However, all the time saved was available for other work, so the operator was in line for better wages.

This plan, however, does not work out so easily on other jobs that are not run so often, and though they have operations similar to the recurrent standard operations, they require so much special attention as to matching of color, information as to two-tone effect, striping, etc., that a considerable amount of time is necessarily wasted on the preliminaries.

In a later article I will explain how the bonus system works, and the desirability of a careful check of burden and indirect labor, which is an important item as it increases tremendously, if not carefully watched.

Rubbing Lacquer-Finished Surfaces

Calling attention to the problems involved in rubbing the newer, harder finishes, and describing results obtained through the use of a new kind of rubbing machine exhibited at a secret demonstration

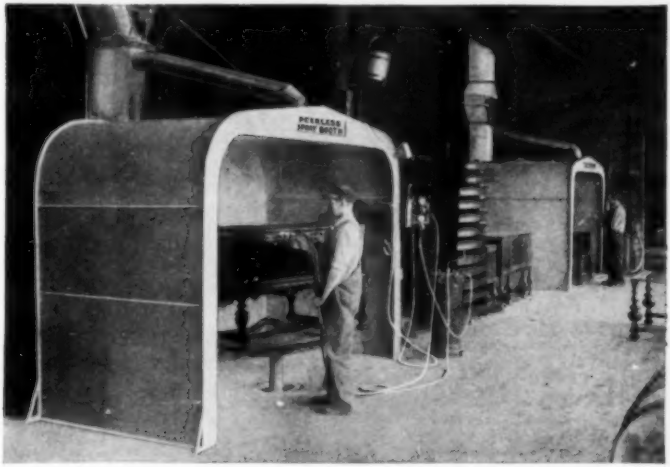
By a Foreman Finisher

WHILE I am one of the "old timer" finishers and hold the position of finishing superintendent in a large production plant, my employers are very strict against any of their men "three-sheeting" themselves, preferring that their identities remain submerged within that of the company. One of our officials, with whom I am particularly friendly, and who talks to me like I was one of his own family, states that he has analyzed this trait and attributes it to the fear that the exploitation of an individual employe may necessitate an increase in his pay, providing he becomes too popular.

I always manage, however, to "pass along" to the trade, certain short-cuts and little stunts which I discover, or which some of my men bump into during the various stages of their work. I do this because of my friendliness for my fellow workers and the earnest desire to promote better finishes, reduced costs and greater production. (I am gradually becoming weaned from a finishing foreman to a production man!)

Rubbing Experience

In the early days I rubbed rough-stuffs and varnishes. It was a much easier task than the rubbing of lacquers today. We



NOW *as never before*

has competition in the sale of beautifully finished products strained every economic advantage in production. Newer and greater demands are made upon the art of applying a masterly finish. Quicker, better finishes at a lower cost have made newer and greater demands upon equipment.

Peerless engineers have not only kept pace with these demands—they have actually anticipated them. Faster working, non-clogging Spray Guns—Spray Guns for Shading, Blending and High-lighting; Spray Booths with newer, exclusive features; Pressure Containers that focus all material handling to one central operation, and many other developments now simplify finishing, reduce costs and improve the work. You, too, will prefer "Peerless" if you will let Peerless equipment prove its worth to you, in your own plant, on your own work. A request for details implies no obligation.

PEERLESS

PNEUMATIC SYSTEMS, Inc.

119 North Jefferson St., Chicago

COMPLETE SPRAY FINISHING EQUIPMENT

hand-brushed them all, too. Since the introduction of lacquer finishes I have noticed that my costs are about the same in the application of lacquer as they were for varnish, but when it comes to rubbing the lacquered surface, I have noted that the cost runs up like a thermometer when a lighted match is held against the bulb! Lacquer is harder than the hinges of Hades and it takes the heart out of many rubbers.

Certain newly-introduced "lacquer rubbing compounds and pastes" (also polishes) are useful, but it has been my experience that a rubbing paste which does the work on some lacquers, falls down on others.

Secret Demonstration

Last week I saw something that is going to gladden the hearts of my fellow finishing brothers and enthuse the lacquer manufacturers. I was "let in" on the demonstration because one of the officials of a big plant wanted my opinion on the class of work obtained during the demonstration and whether or not I deemed the thing practical, so the demonstrator let me in. I was the only practical finishing man present, aside of course, from the owners of the apparatus themselves, so I was sworn to secrecy and stood on the side-lines.

A New Rubbing Machine

A little heavy-set chap with a long jaw, wearing a duster which swept the floor, was demonstrating a rubbing machine which, he claimed, would rub curved and irregular surfaces. It operates on an entirely new principle, and is unlike anything I have previously seen. It is self-contained and takes power from an extension cord plugged into a light socket in the rubbing room (110 volts). I held it and then used it for a few minutes.

When the little long-jawed fellow started on his talk I swallowed his dope the same as I do that which other salesmen, who pester me every day, deal out. When he said that the machine would do certain things, I figured he might think he would pull the wool over the eyes of the bosses present but, being a practical man myself, I was going to unmask him when he didn't produce as "per his bunk."

The Results

To make a long story short, I saw him rub a grand piano case, piano legs, a bench with curved handles and spindles, the surface of a cash register, and an entire automobile body (less the fenders); and he put a polish on it that is the closest to varnish I have ever seen.

The actual rubbing time, as I computed it, was about one-third the time it would take an experienced rubber to do the work. The surface was perfectly smooth and velvety. The gloss would fool any old rotten-stoner who ever lived. When I saw that little machine perform I had visions of seeing my rubbing and polishing costs go down like they would if you held an icicle against my thermometer bulb!

A Promise

I had been sworn to secrecy—not to give out any information about the machine's construction or the company which will market it—but when I talked to that stumpy, long-jawed little fellow who put it through its paces, I apologized for doubting him and suggested that he send INDUSTRIAL FINISHING a cut of it so

You May Be Satisfied

but are you really getting the best finishes?

When you adopted mechanical painting equipment to finish your products, you were well pleased with the improved appearance of the finish, and the greater speed with which your finishing work was done, and the lower costs. Maybe you are still satisfied with the results you are getting. However, in all probability you can even get better finishes than those you are getting now, and at lower cost and with greater speed.

Almost invariably when we come in contact with manufacturers who are fairly well satisfied with the results they are getting and they try the Matthews Finishers Gun and Equipment, they are able to get much better finishes at a substantial reduction in costs.

Some of the largest manufacturers in the country have had this experience with Matthews Mechanical Painting Equipment. Several of the leading paint manufacturers after using all other makes, standardized on Matthews Equipment with which to demonstrate their various finishes and surface coatings. You no doubt will have this same experience after you try the new Matthews Finishers Gun and Equipment. From the standpoint of good business, investigate. You will be under no obligations, and you will be the sole judge.

GET THIS BOOKLET. Send for the Matthews Product Finishing Booklet. This is a 10-page booklet that will give you complete information on the newest developments in mechanical painting equipment for product finishing.

W. N. MATTHEWS CORPORATION
3744 Forest Park Blvd. St. Louis, U. S. A.

MATTHEWS
MECHANICAL PAINTING
EQUIPMENT

that this journal could let all the finishers know about it. He said his firm was not sending out anything now, but that the INDUSTRIAL FINISHING was down on their list for a page a month, for the year, so I guess all of my fellow workers will know about it in January.

Covering Capacity of Mixed Paints

Ordinarily this topic would be uninteresting data, but from the viewpoint of the estimator for figuring the cost of a prospective job of painting and decorating or finishing it has its practical value.

Three different kinds of surfaces must be considered in calculating the spreading power or surface extension of liquid paints and varnish. They are a non-absorbent surface like sheet iron, a neutral or primed surface, and an absorbent surface like whitewood, or soft pine. On a non-absorbent surface, all paint oils, varnish, and mixed paints will cover practically the same area of surface, providing their respective viscosities are similar.

Raw linseed oil with a viscosity of 4 (water = 1) will cover, by dipping, about 900-sq. ft. per gallon of oil.

Varnish, with a viscosity of 20, which is relatively five times thicker than oil, will cover about 720-sq. ft.

Mixed paint, with a viscosity of 40, will cover about 540-sq. ft.

The approximate thickness of the oil film will be about one-thousandth of an inch (.001-in.); that of the varnish film about .0015-in.; and that of the mixed paint about .002-in.

By applying the materials with a brush and brushing them out well, it is possible to cover more surface, but in such cases the films will be correspondingly thinner. On a neutral or primed surface, the covering capacity by dipping will be done one-sixth less; while on an absorbent surface like soft pine it will be usually one-third less, although is liable to vary in accordance with the porosity and brashness of the wood.

In a general way it will be safe to estimate the covering capacity of oil, varnish, and mixed paints as follows:

1-gal. of oil, on iron, covers 900-sq. ft.
1-gal of oil, on primer, covers 750-sq. ft.
1-gal. of oil, on soft wood, covers 600-sq. ft.
1-gal. of varnish, on iron, covers 720-sq. ft.
1-gal. of varnish, on primer, covers 600-sq. ft.
1-gal. of varnish, on wood, covers 480-sq. ft.
1-gal. of mixed paint, on iron, covers 540-sq. ft.
1 gal. of mixed paint, on primer, covers 450-sq. ft.
1-gal. of mixed paint, on soft wood, covers 360-sq. ft.

The above figures include loss by evaporation, waste, etc., and are considerably lower than those specified by the paint manufacturers who quite generally claim that a gallon of their mixed paint will cover from 250 to 300-sq. ft. of surface, two coats.—J. Conselmar.

Select Materials, Methods and Men to Suit Job

To the man who gets around among a number of manufacturing plants, finishing ideas in great variety are presented. Some of these are positive and some are negative. The negative ones are as valuable as the positive, for they represent the experimental or development work that some

Inspection

Each part of a Worthington **FEATHER** (Reg. U. S. Pat. Off.) Valve Vertical Compressor is inspected before assembly. After assembly the machine is given a running test with the valve head removed. This is to make sure that no oil passes the piston.

The valve head is then put on and the compressor tested under operating conditions. The performance of each component part and of the compressor as a whole must meet the rigid Worthington standards before a compressor is released for shipment.

It is these little things—mighty in the effects they produce—which contribute to the unsurpassed success of the Worthington Compressor in the application of paint, varnish and lacquer guns.

WORTHINGTON

6712-3

COMPRESSORS **PUMPS** **OIL and WATER METERS**
OIL and GAS ENGINES **CONDENSERS** **FEEDWATER HEATERS**

WORTHINGTON PUMP and MACHINERY CORPORATION
115 Broadway, New York City Branch Offices in 24 Cities

Kindly mention INDUSTRIAL FINISHING when writing advertisers

one has done. Ultimately, we eliminate certain obstacles which are encountered in the natural course of progress, and thereby we find the better way and make it a well defined path.

Many little "kinks" are developed in all fields of endeavor, but some of them are forgotten because they are not in daily use. Such ideas are extremely welcome, however, when presented again.

One of the easiest things to forget is that different coatings are required for two jobs that are practically alike, or for the same job if the method of application is changed—as from brush to spray. This necessity for distinguishing between jobs or methods is a matter of growing importance, since both quality and costs are directly concerned with it. It is something that must be as much a daily matter as is the selection of an abrasive wheel particularly adapted to the one job only.

Take the matter of varnish, for instance. To some men, varnish is just varnish and they would put a coating from the same can on a depot floor, or on a mahogany clock; they would expect the one to brush on, as readily as the other sprayed. Education is the one method of learning the value of selection.

For example, floor varnish is a "long-oil" varnish, that is, it has a heavy oil content. For that reason it is very durable, it spreads well and it is an excellent treatment for a wood surface. Varnish for vertical surfaces, on the other hand, do not need to be good resistants to wear, where there is no wear, but they should not be "runny." Such "long-gum" varnishes have a higher percentage of gums in them, hence they are stiffer when applied; they are the proper thing to use for spraying where sagged surfaces are so objectionable.

All too often these sag lines, about which we hear so much, are the result of unwilling workmen. If a man dislikes the job of spraying, he can find ways enough of discrediting both the tools and the materials. Whenever something new is being introduced, there are workmen who do their best to make it a failure.

Several years ago the paint crew at a certain car shop was ordered to begin varnishing the interiors of passenger coaches with spray guns, but at first the plan met with the indifferent success because of sag lines which always showed on the panels. Not until a persevering foreman had laid off four men (who could brush panels but would not spray them acceptably) did the men learn that the spray guns were there to stay. After that, there was no more trouble with sagged surfaces.—D. A. Hampson.

Many fires are reported as of "mysterious origin," because no one knows how they started. The evidence of the cause is burned. But no matter how a fire starts, it takes its toll of everybody—directly of those connected with the factory, indirectly of the people at large.

LACQUERS for Autos

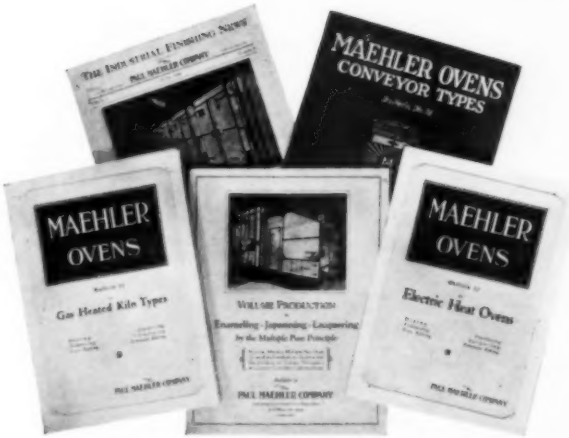
Extensively used, free from gum, uniform, reliable and economic. Pioneer lacquer makers who can satisfy your requirements. Write for prices.

Chas. Cooper & Co.

90 Worth St., New York

Works—Newark, N. J. Since 1857

This Section is devoted to the application, baking and polishing of finishes to be dried in ovens.

Baked Finishing

These Bulletins Will Interest You

They describe and illustrate various types of gas, electric and oil heated ovens, also special types of conveyor ovens used in connection with automatically dipping and baking small parts. Volume production in enameling, japanning and lacquering is the paramount idea back of Maehler Ovens. May we send you these bulletins?

The PAUL MAEHLER COMPANY
INDUSTRIAL OVEN BUILDERS
2220 W. LAKE ST. CHICAGO, ILLINOIS

Quincy Model H

A popular spray painting unit. Either 3 x 3½ in. or 4½ x 3½ in. compressor, for 1, 2 or 3 gun operation.

Prices as low as

$140

for complete units

You Can Depend Upon This Compressor

Your customers depend upon you for a quality paint job. Give them that, with good service, and you'll not need to worry about present profits or future business.

To turn out a smooth, perfect finish, your spray gun needs a steady, unfailing, dry air supply. And for that, *you* can depend upon a Quincy Compressor. Quincys are engineer-designed and built by us, not assembled. Their silent, trouble-free service and long life complete the efficiency of all standard paint spray outfits. Be sure to specify "Quincy" when you order new equipment or replace your present compressor unit.

Clip and mail this advertisement for complete, free information

QUINCY COMPRESSOR CO.

305 Main St. QUINCY CO COMPRESSOR **Quincy, Ill.** K750

Formerly Wall Pump & Compressor Co.

Japans, Baking Temperatures and Oven Heating

Modern Japanning Practice

First installment of a series of articles explaining the uses of japans, their application and baking, together with practical information on modern equipment and methods used

By T. E. Moorefield

FENDERS, splash guards, radiator shells and many other removable parts of modern automobiles are almost universally finished with black baked japan, as this material is economical in application and durable in wearing qualities. It is economical in that the first cost of material is low, as compared to many other finishing materials, and the cost of application is less than where the material must be applied by brushing or spraying.

That such a finish is durable is beyond question since it is a frequent occurance to find the finish on fenders and such parts actually outwearing the finish on the body itself. Even automobile refinishing shops will profit greatly by the use of baking japan on all removable parts which look well when finished in black, provided, of course, that the volume of work is large enough and the parts are so constructed that they can be safely dipped and baked.

What Japan Is

Before proceeding further, it is advisable to define the word "japan" and thus avoid any misunderstanding. A japan may be described as an adhesive, opaque coating that has been prepared from oils, dryers, volatile thinners and certain resinous asphaltic materials such as gilsonite and pitch, according to a number of formulas known only to reputable varnish manufacturers.

It may be of various grades and qualities, depending upon the use to be made of it and the price paid for it. The finishing coats usually do not contain pigments, and they bake to a high luster, but material for the first coat frequently is made by grinding carbon black, lamp black or other pigments into the finishing material to give it more solid covering properties and thus aid in hiding sharp edges, seams, bolt heads and such parts.

Application of Japan

Japan may be applied to metal, wood, leather, paper and other materials by brushing, spraying, dipping, flowing or tumbling, to give a hard, durable, lustrous finish, or to impart other special properties not easily attained by other means.

It is usually understood that a japan is hardened by baking in an oven that has been heated to the proper temperature with electricity, gas, steam, coal, coke, or by some other means, although some people also speak of "air-drying japan," meaning a black opaque material which air dries to a hard lustrous finish resembling that of a baked japan.

Baking Temperatures

The degree of heat and the length of baking time depend largely upon the material, the type of oven, the number of pieces baked at one time and many other such conditions. For automobile work such as fenders, hoods, etc., the temperature varies from 250 to 300-deg. F. up as high as 450 or 500-deg. F., and the time varies from about 45 minutes to two or three hours. The average schedule, however, is about an hour at 400 or 425-deg. F.

The term "enameling" is often used interchangeably with the term "japanning," but, strictly speaking, the term "enamel" should be applied only to the siliceous products that are fused at temperatures in excess of 1000-deg. F., to form a hard, glass-like surface similar to that on bathroom equipment. One of the definitions of an enamel in Webster's Dictionary is, "any of various enamel-like varnishes," however, and people who speak of japans and other varnish products as enamels have some justification for their use of the word.

Some people also speak of "colored japans," but I believe the general conception of a japan is a black product. At least, in this series of articles I shall write of japans as black, asphaltic, varnish-like materials that are hardened by baking in suitable ovens.

Articles Japan Finished

As mentioned previously, japans are applied by a number of methods, depending upon the nature of the article to be coated, the quantity of work to be done, the type of finish desired, and other conditions. In these articles I shall refer primarily to those japans that are applied by dipping on fenders, hoods, radiators, stove parts, and other articles made from sheet steel or castings. Much of the information, however, applies equally well to those japanning rooms where other methods are used to coat the work.

Equipment Used

No definite rule can be given as to the choice of equipment, since so much depends upon the kind and amount of work, the results desired and many other conditions which are different in each case. Roughly, the japanning room should be provided with one or more ovens of a suitable size to take care of the work in hand, together with the required accessory equipment, such as dip tanks for the first coat and finishing coats, drip racks over which to hang the articles while dipping, hooks of the correct size and shape to hang the parts at the proper angle to get good draining qualities, and possibly some conveyor equipment.

For the average automobile refinishing shop, an oven with an inside width of 6-ft., depth 8-ft. and height 7-ft. will usually be about the proper size. The oven walls should be of sheet metal, properly insulated with heat resisting materials to prevent the loss of too much heat by radiation.

The interior construction should be such as to give as nearly as possible a uniform temperature in all parts of the oven, so as to give uniform results and prevent some parts being overbaked, while others are underbaked. One or more reliable thermometers should be so placed as to indicate correctly the heat of the oven. Recording thermometers when prop-

erly placed are very useful, as they give a continuous record of the heat conditions inside the oven.

Automobile Finishes—Baked Enamel

Baked enamel or the black japanned finish is, I believe, the best finish of today as a black finish. It is a blacker black, a tougher finish which will stand considerable drawing or banging, and the finish in itself has an everlasting luster. This finish has been discontinued as a body finish by a number of automobile manufacturers on account of the great demand for color today. But practically all motor car manufacturers are still holding to the black baked enamel fenders.

As I see it, the japanned finish has but two drawbacks. The first is that it cannot be had in colors, and the second is that it is the greatest scum collector when exposed to the weather for a considerable length of time.

A satisfactory cleaner for japanned surfaces that have become dull and smoky is a good liquid metal polish. This will remove the scum and leave the finish in its original state of brilliancy without leaving an oily or waxed surface.—C. Schroeder.

Preventing Streaks in Brushed Japan Finish

There are numerous tricks to be learned about brush work, although this may be called the day of the spray gun. A certain plant making office devices has in its line, one article about four inches square that must be brush-coated, because dipping or spraying puts finishing material where it can not be tolerated.

The chief complaints the concern had were that the black coating showed brown, that it did not dry fast enough to handle the same day, and that the touch of human fingers dulled the finish. Air-drying black japan was used.

A study of the troubles showed that over a section of smooth, bright steel the finish really was brown and streaky. But this was overcome by using a clean soft brush, and by using the japan in fresh lots—clean and not too thick. Previously, the brushes had been put back in a can with the remains of a batch of japan, and sometimes they were not used again for several days. It was not strange, therefore, that they acquired hard spots which would draw or "pull" the japan enough to leave streaks, especially if it happened to be too thick to flow properly.

The trouble with the glossy finish becoming dull was due partly to using too thick a coat, but chiefly from the preparation. These metal parts had been washed in kerosene to remove chips, after which they were wiped with a cloth and passed along to be painted. It was found that washing the metal parts in gasolene was a big help and, later, that the process of boiling in a soda or kindred solution enabled the workmen to put on a brush coat that became hard enough to handle in two hours, and that the finished surface would not dull at all when fingered the next day.

Experiences such as these go to prove that industrial finishing is no exception to the rule that successes in large things come from attention to details that are seemingly unimportant or unrelated.—H. A. Donaldson.

Automobile Lacquer Finish Sanding

Advertising Manager of Minnesota Mining & Mfg. Co. submits interesting comments and facts on waterproof abrasive papers and their use in connection with modern automobile lacquer finishing

By W. P. Stewart

A SHORT article about waterproof sandpapers, submitted to our technical department for possible correction and comments, has been revised to read as follows:

"There are two types of waterproof sandpapers for automobile work. One is coated with garnet mineral, which is a natural mineral, while the other is coated with artificial mineral which is a manufactured mineral.

"Although waterproof garnet papers cost less than waterproof artificial papers they do not wear as well, nor cut as rapidly. The problem of economy is well worth studying by the individual shop to learn which is the most economical for its particular needs.

"The papers mentioned are listed in regard to grit size, and correspond as follows:

Waterproof Artificial Paper	Waterproof Garnet Paper
400*	
320*	
280	8/0
240	7/0
220	6/0
180	5/0
150	4/0
120	3/0
100	2/0
80	1/0
60*	

*These have no corresponding grit in garnet paper.

In regard to this article and the original copy, I believe I should point out certain things that need to be taken into consideration. I do not assume to be a technical abrasive man, nor an expert in the matter of finishing methods, so my statements are more in the form of suggestions than criticisms.

Some Abrasive Materials

In the first place, I noticed in the original copy the statement that, "there are two grades of waterproof sandpaper for automobile work, one of which has a coating of common garnet or sand of a certain kind, while the other is covered with artificial grit, dark brown in color." The word "sand" in this case might be misleading, for sand as we know it, is rock pulverized by nature and has no cutting edges.

The grit of sandpaper is produced by crushing garnet or other "minerals" and screening it to uniform grading. The edges of this crushed material are sharp. To distinguish it from the ordinary dull sand, we always refer to the grit used for sandpaper as being "mineral." In addition to garnet mineral used as coating for various kinds of abrasive paper or cloth, there may be flint, emery, silicon carbide, aluminous oxide, or mixtures of these. The last two mentioned are the kind apparently referred to in the article as being artificial. It is well, in this connection, to explain why the mineral is called artificial.

The word "artificial" does not in this sense have anything to do with "artifice" or the opposite of genuine, but, means a manufactured mineral rather than a natural mineral. Silicon carbide is a

very hard and rather brittle material, black in color. Aluminous oxide is possibly less hard but a trifle tougher than silicon carbide, and is brown in color. It is especially good for metal work because of its toughness and the fact that it does not splinter as easy as the other.

On the other hand, we recommend silicon carbide for most of the work on lacquer and varnish because, in the fine grades, its brittleness does not result in easy fracture, and its extreme hardness and sharpness gives it wonderful cutting power.

It might not be out of order to question the statement that sandpaper, with artificial mineral, is more economical than sandpaper with garnet mineral. While it is true that garnet does not have the lasting qualities of this artificial mineral, it is a fact that in many automobile repaint shops sandpaper is not used to the absolute limit of its keenness before being discarded. It is possible that garnet has enough endurance to give certain finishers all the service they would obtain from any sandpaper they might use. In these cases garnet paper would probably be more economical than the other kind, since it costs about half as much.

One of our technical men submits the following comments and recommendations in regard to the use of waterproof sandpaper in connection with automobile lacquer finishing:

Modern Automobile Finishes

"There appears to be no doubt but that the use of lacquers (pyroxylin finishes) has come to stay in the automobile game for use in production plants, as well as in repaint shops.

"The finish and color combinations, which lacquers have made possible, seem to appeal greatly to the buying public, and it is doubtful if it will ever be willing to go back to the somber colors used during the days of varnish.

"There is no question but that the finish on an automobile body has a great bearing on its sales value and unquestionably, as competition gets keener, which as it seems to be doing monthly, it will behoove all body painters to put forth additional efforts to produce the type of finish necessary to please the public.

"This type of finish will be a lacquered surface, free from orange peel, and causing a depth of luster which will bring out to the best advantages the color combination used. Such a finish is made possible by the way in which the undercoats and lacquers are applied, and the methods, grits and quality of abrasives used in surfacing them down.

Sanding Operations

"The first essential thing to do after the undercoats have been properly applied and dried, is to smooth them down to a level and give them a plate glass surface free from scratches. This can be accomplished by leveling the surface by a water sanding operation, using No. 220-C waterproof sandpaper and then slicking up with No. 280-C paper.

"The lacquer coats are then applied and, due to their application by spraying, they may show orange peel or spray pit marks, which must be properly removed in order to bring the surface to an ideal level which will best produce the depth of luster desired. This orange peel can be removed and the surface properly leveled by wet sanding, using

No. 320-A waterproof sandpaper with water or water containing 4 percent sanding liquid.

"Wet sanding of lacquer is the best known medium for removing orange peel. With proper materials, a workman can perform the operation quickly and give a perfect scratchless surface, ready for polishing.

"The lacquer is then polished with a polish which is mild in its cutting action and carries no ingredient that might be harmful or reactionary to lacquer. The result is a beautiful luster and depth of color which time or elements will not mar. Cars finished along these lines are bound to appeal to the buyer, who today seeks beauty of finish as well as mechanical perfection in a motor car."

Scaling, Chalking and Blistering of Exterior Paints

When white lead or other exterior paints scale or peel off, the trouble is generally due to one of the following causes: wet wood, in the case of primers, or an insufficient amount of binder—that is oil, etc., in the primer; and in the case of second coats, an excess of zinc in the paint, or the fact that paint applied over an "enameled surface" primer will result in scaling.

Chalking generally takes place in paints containing pigments that carry a minimum amount of oil and which have been thinned in part with turpentine and benzine. The locality also has something to do with the defect as for instance, at the sea-shore and in cold and hot climates. White lead is perhaps more subject to this defect than any other pigment, and it is customary to combine it with a certain amount of zinc oxide or other oil-carrying pigment, or inert material, to prevent chalking.

It has been found that for sea-shore paints, subjected to the influence of salt air, more zinc oxide is needed with the white lead than for paints designed for a dry climate. For example, 30-lbs. of zinc white in oil with 70-lbs. of white lead in oil are required for a sea-shore paint, but only 15 or 20-lbs. of zinc white are required in the 100-lbs. of pigment paste for an inland paint.

Blistering of paint and varnish is due almost entirely to heat and moisture. Woodwork containing much moisture, when painted and exposed to the heat of the sun, will produce blistering, and the more oil there is present or the darker colored the paint, the more sure the paint is to blister. Lamp black in oil will blister more readily than white lead in oil, but if a certain amount of turpentine be used, neither paint will show blisters.

Blistering on iron work generally occurs in the winter and usually it is caused by painting the metal when it is frosted or intensely cold. Condensation of the frost produces moisture when the painted surface is exposed to heat, the result being that the moisture in trying to escape invariably produces blisters, unless the paint film is quite porous.—E. C. Pearson.

There are several good nitrocellulose or pyroxylin lacquers on the market today that in themselves are excellent products, but which are at the mercy of the operator when it comes to application.

To Readers Of

Industrial Finishing

This journal is designed especially to suit your particular needs and we want to know what information you desire, what problems or difficulties you have and how we can assist you in your work. It costs you nothing to make inquiries or to tell us what subjects you wish to see discussed in our reading pages.

Many times you have probably felt prompted to write some of your own experiences, opinions or ideas. Now is your opportunity. INDUSTRIAL FINISHING solicits articles from practical men and pays for all acceptable material.

Kindly express yourself by writing us just what subjects you would like to see covered by articles in the publication; or just what subjects you might write on for publication. Address your communications to

INDUSTRIAL FINISHING, Room 603, 222 East Ohio St., Indianapolis, Ind.

SAVE MONEY in the FINISHING ROOM

Save by Saving

Vilas Mixing Tanks

Mix your lacquers, enamels, paints, etc., ready to spray—No evaporation; no loss of operator's time mixing spray cup at a time. Further information from

R. L. VILAS

278 Whalley Avenue New Haven, Conn.

Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Enamel on Galvanized Iron

We experience some trouble in having white enamel paint stick to galvanized iron. We wash the iron with acid before applying bond coat, but it comes off occasionally just the same.—C.R.Co.

Washing the galvanized iron with acid before painting should put it in a fairly good condition for receiving paint provided, of course, the excess acid is removed, and there is no trace of grease from hand prints or other sources which may get onto the work after it has been cleaned.

There is a great difference in the adhesion power of various paint materials. If you continue to have trouble, we suggest that you get in direct touch with various paint and varnish manufacturers who carry advertisements in this magazine, state your problems to them fully, and no doubt they will be able to aid you in finding a solution.—I.F.

Lacquered Brass in Sun

Which kind of lacquer would you recommend on brass which has to be in the hot sun and rain, etc.? I have tried some lacquer but find it stands up only about three weeks.—K. Jacobs.

Clear nitro-cellulose lacquers, as a rule, are not very durable on exposure to the hot sun and rain, whether on brass or other surfaces. This probably accounts for the fact that the lacquer you have tried stood up only about three weeks.

One or two of the larger lacquer manufacturers, however, have perfected clear lacquers which do stand a great deal of outside exposure and if these special clear lacquers are used, we believe you will be well pleased with the results.

In the event that you do not find a lacquer that has long enough life to please you, it might be well to try a thin coat of spar varnish on the brass which will stand outside exposure.—I.F.

Decorating Hot Water Bags

In reply to M. K. D.'s question under the above title in October issue, any paint material used to apply wreaths, sprays of flowers, etc., on rubber objects must be very flexible in order not to crack when the rubber is bent.

The method which you use of reducing oil colors with the best spar varnish and laying the paint on very thin, is probably as good as any. It is of special importance to put the paint on as thin as possible, for the thicker it is applied, the more likely will it be to crack with use.

Some of the larger paint and varnish manufacturers have ready-prepared enamels for use

MECCO

SOLVENTS
THINNERS
SOLUBLE COTTON
COTTON SOLUTIONS

We Manufacture

MECCO SOLUBLE COTTON
MECCO SOLVENTS

And are equipped to supply standard cotton solutions and thinners, or to make these up in accordance with your most exact specifications.

ACETATES ETHYL BUTYL AMYL
METHYL ACETONE
METHANOL 95%; 97% PURE DENATURING GRADE

THE MINER EDGAR CO.
110 WILLIAM ST.
NEW YORK -:- NEW YORK

on inflated rubber balls and similar rubber objects, which are very elastic and give good results. Wherever it is possible to apply a little heat to enamels of this type the results are better, for some of them are built on the principle of being partially vulcanized or attached permanently to the rubber, by a slight heat treatment.—I. F.

Lacquer as First Coat

With reference to an inquiry under the above title by D. & Son in October issue, I believe that for the particular job in question, the best first coater you can use on soft woods is a clear lacquer. This fills up the wood and levels the surface which then can be sanded smooth. Or, a small amount of the desired color can be used, which helps in covering for final coats.

Sometimes a number of coats are needed to cover the grain in such wood as fir, where the grain is alternately hard and soft. Pine, after being coated, sometimes shows a sap area which reveals traces of the grain. This should be coated with shellac, a number of times if necessary, but sufficient body must be applied on any wood to hide the grain.—J. K. C.

Transparent Crackle for Lamp Shades

Would be very pleased to know how to obtain a transparent crackle finish effect, either brushed or sprayed on, finish to be over lamp shades which are made of parchment or stiff paper. At present, these shades are given a brush coat of shellac, decorated with oil colors, and then given a coat of varnish which has given good results for the regular finish. The finish must imitate cracked crockery, showing the hair lines through. A colored crackle is useless in this respect; it must be transparent. Have tried shellac over varnish, and this gives results, but the process is too slow, from a production point.—J. C.

Several of the larger lacquer manufacturers are now producing transparent crackle lacquer. In making a transparent crackle finish with this material, one or two coats of a clear lacquer should be applied next to the surface of the lamp shade or other object, and when these coats are dry, a coat of the clear or transparent crackle lacquer should be applied by spraying.

As this coat of transparent crackle lacquer dries, it will spread apart into irregular squares, leaving cracks in the finish. Any decorations that may be desired should now be applied and the work finally protected with another coat of clear lacquer.

Transparent crackle lacquers, as a rule, have one disadvantage in that they do not dry as hard as the more familiar colored crackle lacquers. This defect can be partially overcome by subjecting the crackled lacquer coat to a mild degree of heat for a short time to aid it in hardening.—I.F.

Air Pressure for Spraying "Duco"

In the November issue of INDUSTRIAL FINISHING, page 97, we note a question from "C. F. M. & Co. Inc." regarding the proper air pressure for spraying Duco No. 1643 clear; Duco No. 1651

flat; Glidden's No. 35 clear lacquer with the DeVilbiss type "A" gun. We note also the reply by the DeVilbiss Co. recommending a pressure of from 60 to 80-lbs.

Of course we cannot give you any recommendations regarding Glidden's No. 35 clear lacquer but we wish to take exception to the DeVilbiss recommendation of 60 to 80-lbs. for our two products listed.

We recommend an air pressure of between 50 to 60-lbs. and we do not recommend an air pressure for these products above 60-lbs.—E. I. du Pont de Nemours & Co.

Bluish Cast on White Lacquered Steel

The firm I work for manufactures electric refrigerators. These boxes are all steel and are finished in white lacquer. We have had trouble with our doors and panels not having the same cast as the box, although they receive the same treatment. They generally have more of a bluish cast than the boxes. The method we are using consists of: One coat of oil primer sprayed on; two coats lacquer surfacer sprayed on; five coats lacquer enamel sprayed on. If you can give me any information that will help to overcome same I will surely appreciate it.—M. W. P.

It would seem that five coats of lacquer enamel should cover solidly and give a uniform finish from the standpoint of color on your doors, as well as on your boxes. We are inclined to believe that perhaps you are applying a thicker coating of lacquer on the boxes than on the doors, as they undoubtedly are finished separately and perhaps by a different spray operator.

You might follow the practice of some furniture manufacturers of sending the doors of each refrigerator to the same spray booth at the same time with the box itself so the doors will be coated by the same man, out of the same spray gun, and at the same time the box is coated. If this fails, it might be well to call in various lacquer manufacturers in an effort to solve your problem. —I. F.

Correction of Linseed Oil Article

In your November issue you have on page 42 an interesting article regarding Linseed Oil, by "B. M. Z." Your writer's statement, however, in the third paragraph about raw linseed oil being extracted from cold seed and boiled oil from heated seed is incorrect.

Raw linseed oil is pressed from warm seed and boiled oil is simply raw oil boiled, with the necessary amount of dryer added to it.

You may want to make correction in your December issue so that anyone having previously read your article will understand that you know how raw and boiled oil are made.—Yarnall Paint Co.

For Exposed Oak Doors

Referring to Mr. J. Kuhn's request, in October issue, for information in regard to finishing exposed oak doors, there should be no turning black if proper treatment is given at the start. An exterior door should be filled with paste filler which has been colored to suit, with oil or japan

color. After the filler has dried somewhat, rub off the excess across the grain.

After complete drying, if the pores are still open, fill again with a thinner coat of filler and rub again. This should fill the pores thoroughly so the filling is flush with the wood. The top and bottom edges of the door should be treated to keep out moisture.

After the filling operation above described and after the door is thoroughly dry, two or three coats of the best spar varnish should be applied. If this method is followed there remains no good reason for the finish to crack, or for any portion of the door to turn black. A coat of varnish should be put on such a door at least once a year. Sometimes the wood in a veneered door will crack and check, but this is no fault of the finish.—J. K. Cooper.

Spanish Walnut High-Lighted

Would like to know what the latest process is in finishing Spanish walnut high-light; also kindly advise where we could secure the materials for finishing same. We are going to make a suite in walnut and birdseye maple, and would like to know how to finish the birdseye maple and walnut in high-light finish, and the colors of striping that should go with this suite.—W.H.S.

Different furniture manufacturers use different methods for producing Spanish walnut effect on walnut. Some of them use a Spanish walnut water stain, followed by a wash coat of shellac, sanded smooth, a coat of filler, shaded or antiqued where necessary, and stripes or decorations; then two or three coats of clear wood lacquer.

Others get the color on the wood by using a combination stain and filler, followed by the antiquing operation, decorations and color lacquer coats.

A method employed to a considerable extent also, consists of fogging an amber-colored stain onto the wood with a spray gun, putting it on lighter in some spots than others, and then further accentuating the high-lighted effect by shading or antiquing certain parts of the work with antiquing stain, followed by stripes or decorations, and two or three coats of clear lacquer.

Of course, varnish can be used to replace the lacquer if desired, but the fact is, that most Spanish walnut finishes are turned out in lacquer.

Any color of striping can be used that will harmonize well with the warm brown tone of the Spanish walnut. Some people use a Spanish red stripe, others use dull gold, pale green, and similar harmonizing colors.

Suitable finishing materials for producing Spanish walnut finish can be obtained from any reliable manufacturer of stains, fillers, varnishes and lacquers, several of which advertise in this magazine. —I.F.

Why Lacquer Dries in Spots

In October issue J. N. W. asks why lacquer dries slowly in spots This question would seem to indicate that grease or oil of some kind is on the wood being lacquered. This would certainly cause lacquer to dry slowly and sometimes not at all, excepting on the surface. I know of one case where wax was used in connec-

tion with the veneering. After the wood was lacquered there would appear spots that did not dry.

Wax of any kind will keep lacquer from drying. If, after investigating this trouble, you cannot find the fault, try a thin coat of shellac before lacquering. You don't state whether these tops are stained or finished natural. Perhaps you are using an oil stain which has not dried properly in these spots.—K. C. John.

Prevent Resin Coming Through Painted Pine

Our foreman painter would like to know what is the best treatment for yellow pine to keep the grain from raising and the sap from coming through the paint, when it gets out in the weather, especially the sun. Has the southern climate anything to do with this?—A.B.F.Co.

Yellow pine is a very sappy wood and when exposed to an increased temperature, as when the sun shines on it, some of the sap is forced out of the more resinous parts of the wood, and often will come all the way through finishing coats applied over the surface.

Two common methods are used to aid in preventing this occurrence. One of them is to apply one or more coats of shellac over the more sappy portions, before the other paint or finishing material is put on.

Another method which we understand is also proving quite satisfactory consists of the use of an aluminum bronzing powder mixed with a hard-drying, varnish vehicle which is applied over the sappy parts before the paint coats are applied, and in that way helps to hold back the sap.

We have also heard of another method of treating sappy wood of this kind which might or might not be applicable in your particular case. This consists of warming the wood slightly with a blow torch before any finishing operations are started. This treatment draws the sap out, and it can be washed off with turpentine or naphtha on a cloth. Since the excess sap is thus drawn out before the finishing materials are applied, there is not much likelihood of it coming through the finish afterward.

The southern climate, where the sun's heat is warmer, has a tendency to force sap through a finish more than the northern climate. This sap is somewhat similar to turpentine, which is one of the solvents used in paint, and that is the reason it comes through the paint coats so easily. —I.F.

Finishing Gum Gun Stocks

Possibly you have already covered a subject we are very much interested in, namely treating red gum wood to give the appearance of black walnut. We use both woods for gun stocks, and are not quite satisfied with our finish on the gum wood stocks.—O.F.M. & Sons.

In finishing red gum wood to match black walnut, it is customary to use a weak stain on the gum wood. In some instances, the gum wood is also fogged with a spray coat of stain, applying the stain heavier in some parts than in others according to the difference in color of the raw

wood, so as to make the color more uniform and give it a closer approximation to the shade of black walnut when finished.

It is not possible for us to give you definite instructions for doing this as so much depends upon the exact color and type of finish which you desire to obtain. Our suggestion would be that you get in touch with one or more of the reliable manufacturers of finishing materials who advertise in this magazine and explain your problem to them thoroughly. They undoubtedly will be able to help you out of your difficulty.—I.F.

Cleaning Aluminum Without Injury

In the past few issues of INDUSTRIAL FINISHING there has been some talk about removing paint, japan, and lacquer from spray equipment. As reported in your October issue, page 77, by the Paasche Airbrush Co., Mr. Steffen would never find his equipment if it were made of aluminum and were placed in a lye solution for several hours. Aluminum hydrate would be quickly formed, and this would go into solution.

For the past 25 years our company has specialized in industrial cleaning, and it is only within the past decade that materials have been developed that will remove greases, paints, japans, and lacquers from aluminum without tarnishing the base metal. Now, however, it is possible to procure cleaning solutions that will clean aluminum without burning or tarnishing the metal, and the beautiful part of it all is that in many cases these scientifically-designed cleaning materials are even cheaper to use than ordinary lye, and they cannot hurt the metal or the worker.—International Chemical Co.

SUPERIOR WOOD STAIN POWDERS

For Lacquer and all finishes.

Complete variety of shades. Samples and information on request.

W. D. LOCKWOOD & CO.
314 W. 14th St., New York

Scientific control of the varnish industry is really a recent achievement. Today, there are elaborate laboratories whose sole business is to control and improve the quality of the finishes produced.

Metal Ceilings for Bus Bodies

I would like to know the best method to finish metal ceilings in bus bodies a dark mahogany; also the materials used to produce a putty to match dark mahogany stain.—H. M. & Body Wks. Inc.

Street cars, railway coaches, and similar vehicles are usually finished in a light cream or ivory color to give additional light to the interior of the body. In this case, either lacquer or oil enamels are used over a suitable primer.

In producing a dark mahogany finish on metal ceilings, there are three systems which could be used, depending upon the time and expense which you can afford to put on these finishes, and the degree of imitation of real mahogany work you wish to make.

The least expensive method, of course, is to apply one or two

DOLAN'S Superior Wood Finishing Materials

"444" Lacquer Shading Stains

Embody the perfected elements for the delicate high lighting so much in vogue on finer furniture at the present time.

Smoothness in spraying—do not run or bleed. Try them.

Characteristic of DOLAN "Unquestionable Quality" the "555" Lacquer Fillers are dependable—do not bleach or blush. Are rapid drying Pores are permanently filled. They will meet your exacting requirements.

"555" Lacquer Fillers

"Unquestionable Quality"

Stains--Fillers--Shellacs--Lacquers

V. J. DOLAN, President

HARRY J. LINDEMAN & CO.

1832 N. Laramie Ave.

CHICAGO, ILLINOIS

Ask the man who uses lacquer!

PLC

The PLC Trade Mark on the container is a guarantee of a laboratory tested product that today is recognized as giving universal satisfaction. A request will bring a generous sample.

PITTSBURGH LACQUER AND CHEMICAL CO.

PITTSBURGH, PA.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

coats of a solid covering oil or lacquer enamel. This will have the general color of dark mahogany wood when viewed from a distance. This method, of course, does not give any grain effect; it gives only a solid color.

A system which more closely approximates mahogany wood, but which still falls short of being a true reproduction, is to apply a coat of ground color of a brownish-red shade and, after this is dry, apply a coat of mahogany color varnish, which should be brushed out thinner in some spots than in others, so as to give, to a certain extent, the grained effect on mahogany.

The third system would be very similar to that used on metal beds, metal office furniture, etc. It would consist of applying first a coat of ground color of the proper shade, depending upon the exact color of the finished work you want, but it would in general run from an orange color to a dark red color.

After this coat is dry, apply a coat of graining color, made by reducing japan colors or oil colors of the proper shades with turpentine to a brushing consistency. These colors usually consist of burnt umber, burnt sienna, black, and possibly a touch of red, so as to give a darker shade as shown in the pores of the mahogany work. While this coat is still wet, it should be grained with a graining tool, or by wiping out with a crumpled cloth to produce high lights and an imitation grain effect.

Some finishers make a practice of stippling the graining color, after it has been grained, to blend in the light and dark spots so as to make them not too pronounced. Where an extra fine degree of imitation is wanted, small black spots or pores are sometimes put on with a fine brush to imitate the little round pores in mahogany. After these graining colors have dried hard, one or more coats of clear varnish should be applied.

Frankly, I believe the last system is the only one that will give a real imitation of mahogany wood under the conditions you must meet, and it takes some practice and experience to be able to faithfully reproduce mahogany finish on steel.

I am inclined to believe that a lighter colored ceiling, such as ivory or light gray would be much more satisfactory than a dark mahogany one in actual service.

In making a putty to match dark mahogany stain, it is cus-

Now Comes

1927 A.D.

offering you

ANOTHER YEAR OF VALUABLE EXPERIENCE

It is worth your time to learn more about

WOOD STAINING

DAKALITE costs less; it is fadeless, easy to use, and highly artistic.

Send for no-charge samples and literature, TODAY.

Dakalite Products Co., Inc.
Minot, North Dakota

tomary to knead into the putty a suitable quantity of Van Dyke brown, rose pink, Indian red, black or other dry pigments so as to give approximately the same color to the putty as is shown by the stain. In some cases, oil colors are used instead of the dry pigments, but as a general rule, it is better to use the dry pigments than the oil colors. —R. L. Masterson.

Enameling Hot Galvanized Steel

Can you offer any suggestions on enameling a hot galvanized steel surface?

The outer shell of the ice container of our water cooler is made of pieced sheet steel, hot galvanized. We then spray on our enamel, using one coat to achieve a mahogany or green finish, and about three coats to get a white.

We find in some cases that the enamel is not permanent; it has a tendency to peel and chip off easily. Can you offer any suggestions?—C. & H.

Hot galvanized steel surfaces have always given more or less trouble in the way of allowing paint or enamel to later peel or chip off easily. It is claimed by some who have investigated this question that the inability of galvanized steel to hold paint satisfactorily is due to the zinc combining with the oil of the paint film to produce a soap.

The soap material is said to form between the metal surface and the paint and thus prevent the paint from sticking to the surface, so that upon subsequent contraction and expansion of the

PRODUCT appearance is in most cases purely a matter of finish. Take two of your own in their crude state. Finish one up carefully with a good lacquer or enamel like ALAKA, and the other just slip shod fashion with any old lacquer. Put them both on the market and see which of the two sells quicker. See which of the two gets the preference.

In spite of the fact that the products underneath the finish are identical in appearance, in quality, in performance, the ALAKA finished product will come out on top all the time.

You can't talk quality when the eye sees shoddy. You can't economize on the finish and pocket the difference.

We request the opportunity of demonstrating our ALAKA finish on your product under typical conditions in your finishing room.

Have you a copy of our new booklet, "Finishing Facts"

LACQUER & CHEMICAL CORPORATION

214-224 Fortieth St., Brooklyn, N.Y.

0105
Fast Lac

Try it out
at our expense!

Use it as a **First Coat**
Use it as a **Last Coat**
Use it for **Inside Work**

DRIES VERY FAST
DRIES TO A VELVET FINISH

OUR GUARANTEE
Send for five gallons—Prepaid—
If not as we claim, return it.

Jamestown
Wood Finishing Co.
Jamestown, N. Y.

metal, due to temperature changes, the paint breaks off.

Regardless of what may be the actual cause of paint not adhering well to galvanized steel, it is a well known fact that galvanized steel which has been exposed to the weather for some time holds paint much better than fresh surfaces. This is probably due to the zinc surface being attacked by oxygen and other chemicals in the air, to form zinc salts which have a rougher surface and which do not react on the paint film in the same manner that the zinc does.

It is possible to artificially produce this weathered surface on zinc or galvanized steel by using various chemical washes. One of the most commonly used washes is strong vinegar. Practically the same action can be produced by using a weak solution of acetic acid.

One of the best chemical washes is made by dissolving 12-oz. of copper chloride, 12-oz. of copper nitrate and 12-oz. of sal ammoniac in 4½ gallons of water, then add 12-oz. by weight of hydrochloric acid, which is known commercially as muriatic acid. A copper acetate solution, made by dissolving 6-oz. of copper acetate to a gallon of water is also said to be quite sufficient.

In using any of these washes, they should be applied to the metal and allowed to dry; then any dust or bloom must be wiped off with a dry cloth, after which the painting operation should proceed as promptly as possible.

Of course, it is unnecessary to say that any grease or similar material on the galvanized steel should be removed by washing with naphtha before the chemical washes are applied.

ADHESION!

Not for a day, a week or a month
—but *FOR GOOD*

Enamels, Bronzing and Finishing Lacquers that stick to

GLASS, RUBBER, ALUMINUM DIE CAST METAL, BRASS, Etc.

Heat Resisting White Enamel and Clear Lacquers DO NOT DISCOLOR up to 350°F.

Special Ground Coats and Finishing Lacquers for Wood Grain and Marble Reproductions.

High Gloss Enamels for Rubber—Complete Adhesion and Extreme Flexibility.

Wood Sealers—Metal Surfacers—Putty—As well as a Full Line of Lacquer Undercoatings, Enamels, Finishing and Bronzing Lacquers for all Purposes.

ROXALIN
FLEXIBLE LACQUER COMPANY, Inc.
105-109 Seventh Avenue
LONG ISLAND CITY NEW YORK

No. 100 FURNITURE LACQUER

NO. 100 FURNITURE LACQUER IS THE MOST FOOL-PROOF FINISHING LACQUER ON THE MARKET TODAY, AS IT WILL NOT BLUSH OR SEED OUT UNDER THE MOST ADVERSE CONDITIONS. THIS LACQUER HAS A VERY FINE BODY AND RUBS AND POLISHES EXCEPTIONALLY WELL.
WE SUGGEST A COAT OF LASCOROID OVER THE STAIN AND FILLER, FOLLOWED BY TWO COATS OF THIS LACQUER.

The LASCO SHELLAC & LACQUER CO.
Baltimore Maryland.

For a Better Finish Use GRIFFITHS

AMERICAN GROUND ITALIAN PUMICE STONE

A 99% pure product, uniform in grain and hardness. Goes further because each individual particle cuts uniformly, besides producing quicker and better work for the same reason. Our service is also an important factor, since direct importation and our own large and modernly equipped factory enable us to meet your requirements immediately. Try us.

K. F. GRIFFITHS & COMPANY, Inc.
110 East 42nd St., New York, N. Y.

GRIFFITHS GUARANTEED PRODUCTS

Powdered Rotten Stone
Cut Felt
Rubbing Felt
Polishing Felt
Carbon-Tetra-Chloride
Oxalic Acid
Rouge
Soap Bark

ASK ABOUT THEM

FINISHES
ENAMELS LACQUERS VARNISHES
Are made in a Modern Plant Devoted to making Industrial Finishes only.
THE KAYDESS CO.
DAYTON, OHIO

Even when galvanized steel surfaces have been cleaned by one of these chemical washes, there is still a great difference in the adhesive power of various paints and enamels. Some of the larger paint and varnish manufacturers have developed products especially suited for use on galvanized steel and, if after trying the chemical washes mentioned above you do not get satisfactory results, you might investigate the use of one of these specially prepared materials.—I.F.

Brush Handle Finishes

We ask your help in securing a finish for our handles that we can make standard. For our hand dusters we use a 9-in. handle and for our floor and wall brushes, 4-ft., 6-ft. and 8-ft. handles, all of clear hard maple or birch.

The finish we want on all is a natural finish; for the 9-in. handles a high gloss or lacquer, and for the longer handles a French polish.

We want to get our wood turnings from a concern that can also supply just the finish we require, but find difficulty in doing this—particularly as regards the finish—so we have had to do more finishing at our factory than we are equipped for.—B.D.M. Co.

We would suggest the possibility of finishing your handles with a clear handle lacquer made by several of the larger lacquer manufacturers. Two or three coats could be applied to your hand-duster handles, merely by dipping them in the lacquer and allowing them to hang until through dripping. This will give

KESSCO PRODUCTS

Solvents
and
Plasticizers
for the
Lacquer Industry

Our chemists are advisory experts, dependable for counsel and co-operation in your works problems.

Write for our attractive prices. Also let us tell you how quickly we can furnish our products in practically any quantity.

KESSLER CHEMICAL COMPANY
ORANGE, N. J.

N U M B E R

1 2 7

OIL LACQUER dries hard in four hours

Makes a finer job than ordinary lacquer on Wood or Metal, Reed or Fibre—yet gives twice the coverage! Try 5 gallons at the drum price and you'll swear by No. 127.

S. C. JOHNSON & SON
RACINE, WIS.

Satinite Colors

In liquid form, ready for the spray or brush, in over 40 popular shades, offer you the most satisfactory line for the production of colored furniture combinations so much in demand.

Beautiful, Fast, Durable and Safe with 15 years of real service to recommend them.

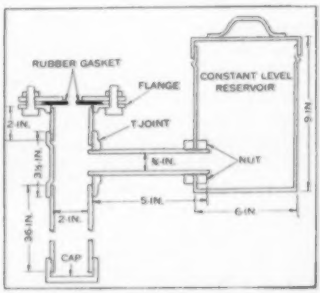
Write for information, or better still, let our service man show you what these materials will do.

STICKNEY COLOR CO.
Manufacturers
Satin Finish Products, Coach Colors, Varnishes and Lacquers
INDIANAPOLIS, IND.

a very high luster, durable finish.

For the French polish effect on your longer handles, we suggest the possibility of using the same clear handle lacquer, except making use of a rubber gasket or squeege machine similar to that shown by the illustration, and apply only one coat of lacquer. Since this coat will be thinner than where the handles are not passed through the rubber gasket, the luster will be less pronounced, and will very closely approximate that given by a waxed handle.

Of course, if you do not care to finish these longer handles by this method, you can finish them



Cross-sectional drawing of lacquer reservoir and dip tank for long slender handles.

by applying shellac or lacquer with a rag while the handles are turning in the lathe; soon after that, apply a thin coat of wax and wipe it off with a rag while the handles are revolving.—I.F.

Thank you for the interest shown by your letter and by the several concerns you asked to write us.

Our experience confirms much that you say regarding a lacquer

SPRUANCE QUALITY

WOOD FINISHING PRODUCTS

Q-E-D
QUICK ELASTIC DURABLE
FURNITURE LACQUER

Liberal samples sent free on request. . . .

9003 Furniture Lacquer—Highest Building Quality, Tough, Elastic, Durable, Easily Rubbed, Accurately Thinned, Ready for Use.

9013 Flat Furniture Lacquer—Same high qualities of 9003 but gives a fine rubbed finished effect which eliminates rubbing.

Years of experience in wood finishing products, together with the stamp of approval of a number of the largest furniture manufacturers, give our Furniture Lacquers an exceptional high standard.

THE GILBERT SPRUANCE COMPANY
PHILADELPHIA

"A FINISH FOR EVERY PURPOSE"

DU-PROS
A Better Shellac
3 Ways Bettered

1. Spreads easier and covers better.
2. Sands smoother with less sanding.
3. Gives a finer, deeper finish, with less shellac.

Send for free tryout can

JAMES B. DAY & CO
224 WEST SUPERIOR ST.
CHICAGO
Manufacturers of
WOOD FINISHING MATERIALS

YAR-PA-CO
PRIMER

THE IDEAL PRIMER
... for ...
LACQUER OR ENAMEL

Write for a free sample

YARNALL PAINT COMPANY
PHILADELPHIA, PA.

KROEGER BROS.
MANUFACTURERS
SINCE 1887

WOOD FILLERS
STAIN POWDERS
STAINS

LET US MATCH MATERIALS YOU ARE NOW USING AND SUBMIT SAMPLES WITHOUT OBLIGATION OR COST.

882 McKIM ST., BALTIMORE, MD.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

finish, our handicap being that with our heating arrangements, it is impossible during the winter to maintain in the factory the working temperature that lacquer requires. So we began getting our turnings from firms who could supply a good finish, but undoubtedly this is more expensive than doing our own dipping.

When we are able to overcome the present temperature difficulty, quite likely we shall do our own dipping again, thus securing better results at lower cost.—B. D. M. Co.

How Long Lacquer Lasts on Woodwork

We are very anxious to obtain all the information possible in regard to lacquer finishes on woodwork. What we would particularly like to get from you, if possible, is an analysis of what you consider a good clear lacquer which will stand up for five years on interior work. And we are also anxious to get an analysis of materials that should go into a first-class pigment lacquer which would stand up for five years on exterior work, such as Venetian blinds on which we intend to use it.

We have been told that pigment lacquers will stand up on exterior work, and each lacquer manufacturer tells us a different story, and we would certainly appreciate any assistance that you can give us in the way of information that you may have accumulated and tests that you may have made.—J. G. W. Corp.

Wood lacquers of today fall into two classes: those which contain a preponderance of resins and a minimum of nitro-cellulose,

Somewheres In Your Plant—

A man frets and fumes because soap and water alone will not remove all the dye-stains from his hands.

Give him relief with PYLAM DYE REMOVER. It is harmless, and completely removes all aniline dye stains leaving the hands nice and soft. Thousands use it. $1.00 package gives three months' relief.

PYLAM PRODUCTS COMPANY
Manufacturing Chemists
799 Greenwich Street NEW YORK
We Make Fast to Light Stains

Practice Economy in your Finishing Room by the use of

FRENCH'S

SAF CO

INDUSTRIAL LACQUERS

Tell us your problems and we will make a Lacquer to suit your particular needs.

Manufactured Only by

Samuel H. French & Co.
4th and Callowhill Streets
Philadelphia

Makers of Finishing Products for Eighty Years.

"AROLAC for EXCELLENCE"

AROLAC

It was our ambition for decades to have lacquers and lacquer enamels excel regular paints and varnishes not only in technical advantages and chemical supremacy, but also in dollars and cents. This is now realized in AROLAC Products. By this, we mean, first: the *covering capacity* of AROLAC; and second: the *price* which makes the use of AROLAC an obvious necessity.

ASK FOR OUR AROLAC

Wood lacquer, Silver and Aluminum lacquer, Bronze lacquer, Brush Brass lacquer and enamels in all colors, glossy and egg shell finishes.

ARIZONA LACQUER MFG. CO.
7-11 Sixteenth Street
BROOKLYN, N. Y.
Chicago, Ill., Office and Warehouse
701 So. Western Ave.
Philadelphia Office and Warehouse
8750 Eastwick Ave.

SAVE At Least 75c per Gallon on Paint & Varnish REMOVER!

From over the country comes enthusiastic comments about the effectiveness of Campbell's new way to prepare Paint and Varnish Remover. And particularly, because Campbell permits you to have a good remover at much less than you are paying now.

FREE—TELLS HOW

A free book "Getting Away From the High Cost of Paint and Varnish Remover" will be sent to you free upon request. We suggest that you write for your copy now, today.

The M. L. Campbell Co.
1007 W. 8th St., Kansas City, Mo.

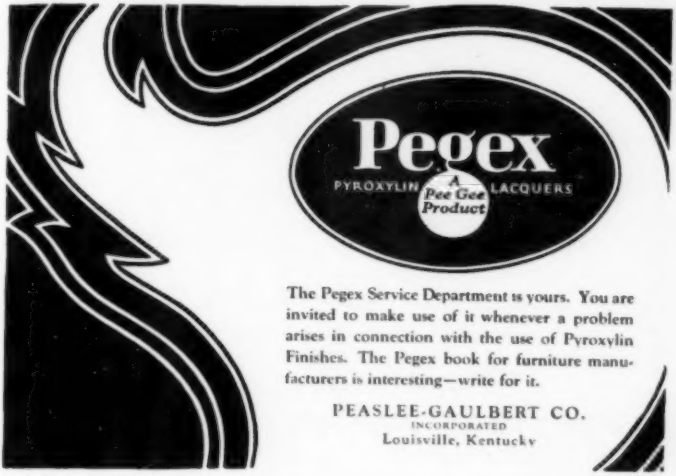
which I personally would classify as imitation shellac; and the true wood lacquers which contain no more than about 1¼ times as much resin as pyroxylin, and preferably less than this proportion. This is an arbitrary division, I realize, but it is my conviction that the latter are far more durable.

I have seen wooden panels of the latter type finish, which have been exposed to laboratory and office interior conditions for over four years, and they are still in good condition. I believe that a good wood lacquer on well-seasoned and filled wood will last almost indefinitely.

For economy's sake, the wood lacquer should contain at least 20 percent of total solids when reduced to spraying or brushing consistency, and should contain solvents of high enough boiling point to prevent blushing under any conditions liable to be met in practice. Inasmuch as woodwork is liable to warp, lacquer should contain a proportion of plasticiser sufficient to flexilize it against the danger of cracking. The lacquer is proof against oil, water and soap solutions.

Pigmented lacquers on metals have stood up under extreme outdoor exposure for periods up to four years, to the writer's knowledge. On wood, however, very contradictory results have been obtained, and such items as wooden spokes on automobile wheels are generally finished in varnish, as lacquer has shown a tendency to give way with the expansion and contraction of the wood.

I believe that the trouble has been the attempt to secure too hard a lacquer, and that a properly plasticised material, on well-



The Pegex Service Department is yours. You are invited to make use of it whenever a problem arises in connection with the use of Pyroxylin Finishes. The Pegex book for furniture manufacturers is interesting—write for it.

PEASLEE-GAULBERT CO.
INCORPORATED
Louisville, Kentucky

IF THE lacquer you are using gives a smooth, tough, adherent film, you can be quite sure that it contains a sufficient amount of

Butanol

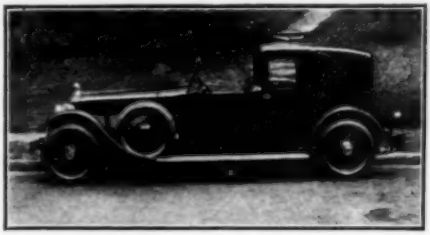
and its derivatives and that you will retain the good will and satisfaction of your customers.

COMMERCIAL SOLVENTS CORPORATION

Sales Offices:

17 East 42nd Street, NEW YORK, N. Y.
Aldwych House, Aldwych, W. C. 2, LONDON, ENGLAND
Terre Haute, INDIANA

Plants:—Terre Haute, Ind., and Peoria, Ill.



PE-CO-LAC

is the thoroughly dependable lacquer
for factory finishing jobs.

Detailed Information upon Request

PECORA PAINT COMPANY

4th St. & Sedgley Avenue

Established 1862 by Smith Bowen — Philadelphia, Pa. — Incorporated 1911

1816 CHEMICALS 1926

"Over a Century of Service and Progress"

BUTYL PROPIONATE

The Economical "High Boiler" for Brush Lacquers

Manufactured by the Wilbur White Chemical Co.

Sole Selling Agents

INNIS, SPEIDEN & CO.

INCORPORATED

48 CLIFF STREET NEW YORK

BRANCH OFFICES:

Chicago Philadelphia Boston Cleveland Gloversville, N. Y.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

seasoned and well-filled wood, would last the five-year period you mention. Any guarantee to that effect at present would be out of the question, as I have no record of wood, finished in lacquer, lasting that length of time.

The most durable pigmented goods are those containing opaque pigments that absorb ultra-violet rays, such as whites, blacks, light grays and buffs. The blues and reds are transparent, and thus permit the actinic rays to penetrate and destroy the finish.

An analysis of a pigmented lacquer should show approximately the same factors as mentioned above for wood lacquers, with a greater amount of plasticiser and an increase in total solids due to the pigment. About two pounds of white or light tints to the gallon, is the general maximum, and I believe titanox to be the best base for whites and tints.

I trust that this information will be of service and I shall be glad to advance any further data that I may have overlooked herein.—S. P. Wilson.

If a little trouble is encountered with new materials at first, do not condemn the product or the finish but consult with the manufacturer, who will no doubt quickly determine the trouble and show the way to correct it.

The chassis of a motor car being refinished, should be cleaned with an alkali system and finished in chassis black of the paint type. Where an alkali system is not in use, the chassis can be washed down with gasoline, the rust spots sanded and the whole finished with chassis black.

"PARAMET"
(ESTER)
LACQUER GUM

Increases adhesion. Makes for greater gloss. Insures maximum toughness in nitro-cellulose lacquers.

Manufactured by
Paramet Chemical Corp.
LONG ISLAND CITY, N. Y.

Get All Your
Stain, Filler
and
Lacquer
from One Source

You eliminate the shifting of blame for poor results among different makers of finishing materials—and the cause for blame itself. Your finishes will work together better—giving you better results in the shortest reasonable time. Ask for a demonstration of any kind of finishes you use, now.

Finishing Products Co.
Indianapolis

MODERN FINISHING PLANT AT YOUR SERVICE

We are completely equipped with Spray apparatus, booths, and other equipment, and can offer the manufacturer of industrial products a finishing service at low cost. Submit samples of your work and we will send estimates on any quantity.

C. L. REICHENBACH, Inc.
142 East 32nd Street New York, N. Y.

Are You Interested in Cutting Down Your Finishing Costs?

If so, let us quote you on finishing toys, wood novelties or any products you may send out to be finished. We specialize in dipping and spraying and can quote attractive prices.

SOUTH SHORE FINISHING CO.,
38 Old Colony Avenue Wollaston, Mass.

No. 82 WATER WHITE LACQUER

For GOLD
For SILVER
For BRASS

A finish to depend upon. An economic lacquer made by pioneer lacquer makers. Send us your requirements.

Chas. Cooper & Co.
90 Worth St., New York
Works—Newark, N. J. Since 1857

DOUBLE DUTY

in every

FURNITURE FINISHING PLANT

from

PROTECT-O-LAC

(1) It is the original liquid masking for the protection of surfaces against lacquer overspray, and is ideal for two-tone work. (2) It is invaluable in keeping spray booths clean.

Prices:
Half-gallon Can.....$3.25
Gallon Can..... 6.00
Money-Back Guarantee.

Several territories open to distributors. Order a trial can from

Continental Corporation
Roosevelt Bldg.
Washington and Wells Sts., Chicago

CLASSIFIED

Advertisements under this heading 45 cents a line, minimum charge $1.35. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.

SHELLAC REPRESENTATIVES

Men wanted who have established following in shellac trade. Excellent opportunity to make good connection with reputable house. Address IF-134, care INDUSTRIAL FINISHING.

LACQUER CHEMIST

Ten years experience making lacquer, wants to develop formula for company that desires good lacquers at low cost. Has had wide and varied experience in development of lacquers. Address IF-143, care INDUSTRIAL FINISHING.

SALESMAN WANTED

To secure orders for shellac and stains by old-established New York manufacturer. Address IF-142, care INDUSTRIAL FINISHING.

HIGH GRADE FOREMAN FINISHER

Of ability and knowledge of the work, having had long experience with some of the best firms, is open for a change. Chairs or furniture. Address IF-141, care INDUSTRIAL FINISHING.

NITRO-CELLULOSE FINISHES

Advertiser desiring change is open to represent, in England, manufacturers of nitro-cellulose finishes of unquestionable quality. Wholehearted service assured for good agency. Address in confidence, IF-140, care INDUSTRIAL FINISHING.

SALESMEN

If you have experience and ability, and are looking for an opportunity to sell varnish and lacquer to the furniture and industrial trade in a big way, we might have an opening for you. Give complete information regarding yourself. Only exceptionally good men will be considered. THE FORBES VARNISH COMPANY, 3800 West 143rd Street, Cleveland, Ohio.

When spraying always use the lowest pressure that will give the desired results, as excessive pressure wastes air as well as materials.

To produce anything concrete we must have form and color.

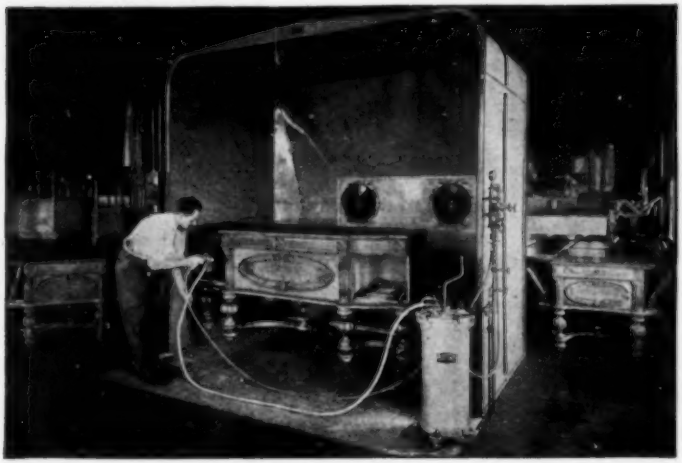
Advertisers in this Issue

Advance Paint Co. 16
Arco Company, The. . . . Third Cover
Arizona Lacquer Mfg. Co. 94
Armitage & Co., John L. 28
Ault & Wiborg Co. . . . . Back Cover
Binks Spray Equipment Co. 100
Campbell Co., M. L. 94
Commercial Solvents Corp. 95
Continental Corp. 98
Cooper & Co., Chas. 53-66-98
Curtis Pneumatic Mchy. Co. 57
Dakalite Products Co., Inc. 84
Day & Co., James B. 91
Denny, Hilborn & Rosenbach. 4
DeVilbiss Mfg. Co. 8
Du Pont de Nemours & Co., E. I. . 37
Egyptian Lacquer Mfg. Co. . . . 50-51
Finishing Products Co. 97
French & Co., Samuel H. 93
Glidden Co., The. . . . . Front Cover
Grand Rapids Blow Pipe and Dust Arrester Co. 49
Grand Rapids Varnish Corp. 15
Griffiths & Co., K. F. 88
Hilo Varnish Corp. 2
Innis, Speiden & Co. 96
Jamestown Wood Finishing Co. . . 86
Johnson & Son, S. C. 90
Kay & Ess Co. 88
Kessler Chemical Co. 89
Kroeger Bros. 92
Lacquer & Chemical Corp. 85
Lasco Shellac & Lacquer Co. 87
Lilly Varnish Co. 6-7
Lindeman & Co., Harry J. 83
Lindeman Wood Finish Co. 1
Lockwood & Co. 82
Maehler Co., The Paul. 67
Matthews Corp., W. N. 63
Marietta Paint & Color Co. 43
Miner Edgar Co. 77
Murphy Varnish Co. 41
Paasche Airbrush Co. 59
Peaslee-Gaulbert Co. 95
Paramet Chemical Corp. 97
Pecora Paint Co. 31-96
Peerless Pneumatic Systems, Inc. . 61
Pittsburgh Lacquer & Chemical Co. 83
Pratt & Lambert, Inc. 25
Pylam Products Co. 93
Quincy Compressor Co. 68
Reichenbach, Inc., C. L. 98
Rockford Varnish Co. 34
Roxalin Flexible Lacquer Co. 87
Sargent-Gerke Co. 47
Sharples Solvents Corp. 45
Sherwin-Williams Co. 26-27
South Shore Finishing Co. 98
Spruance Co., The Gilbert. 91
Spraco Painting Equipment Co. . . 52
Stickney Color Co. 90
Sun Varnish Co. 39
Vilas, R. L. 75
Waukegan Chemical Co. 33
Worthington Pump & Machinery Corp. 65
Yarnall Paint Co. 92
Zapon Co., The. . . . . Second Cover

Now Ready—**Bound Volume No. 2**

Industrial Finishing

Limited number available—first come, first served. While they last. **$5.00**



Facts to consider
in Applying Lacquer

Every ingredient in lacquer is there for a purpose. Unless the material mixture is applied intact and distributed evenly, imperfections in the finish are purely natural, due to evaporation of low boiling solvents. This weakens material when applied. Weak spots result.

These weak spots are sure to give trouble sooner or later. Retouching or partial refinishing is costly. Disappointments, delays and expense are unnecessary. By operating the Binks Spray Gun closely to the finishing surface, evaporation is eliminated; fine particles of essential ingredients can knit together uniformly and become more binding. Result: a finish that needs no tinkering. This is possible with the "Binks Spray Gun" because atomization takes place at the immediate outlet of the nozzle—not at the end of the spray.

Consider this feature. Try "Binks". Make your own tests in your own way. If you wish, Binks engineers will gladly demonstrate. A request for a demonstration implies no obligation. Write for details today.

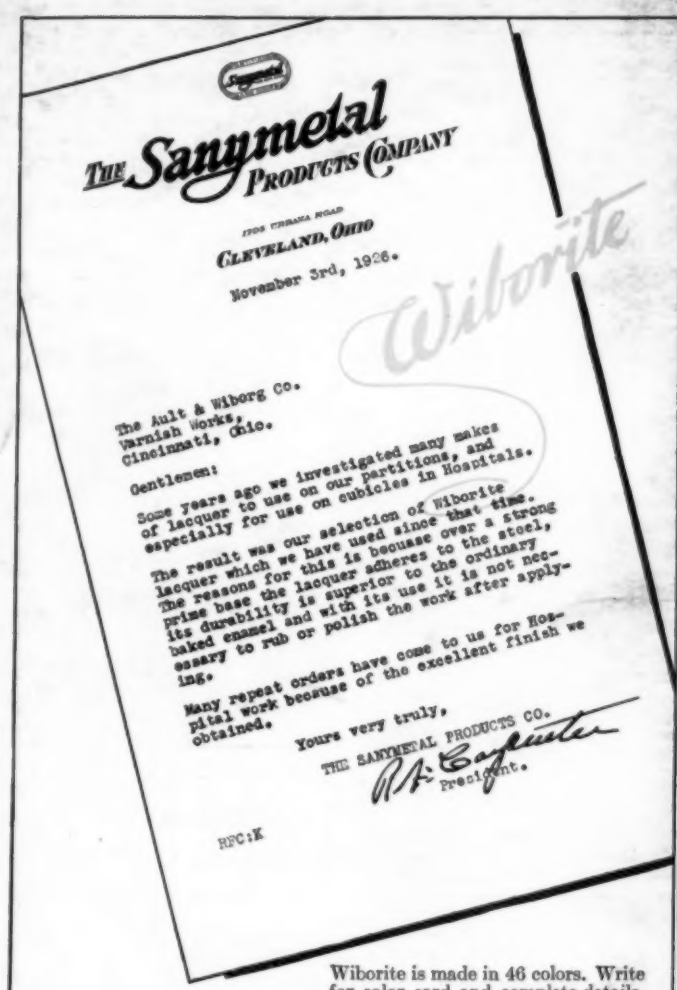
BINKS SPRAY EQUIPMENT CO.

Dept. M, 3114 Carroll Ave., Chicago

Established 1898 — Offices in Principal Cities

Kindly mention INDUSTRIAL FINISHING when writing advertisers

ARCO
VIOLENT and rapid changes of temperature, ranging from one extreme to the other, will not harm the softly glowing beauty of an Arcozon finish. From heated garage to severe blasts of coldest winter leaves its silken luster undimmed.
Manufacturers will also be interested in Arcozon's ease and economy of operation. May our technical department supply you with details?
THE ARCO COMPANY, CLEVELAND, OHIO
Paints - Varnishes - Enamels - Lacquers
SPRAYS ON
ARCOZON
THE ARCO PYROXYLIN LACQUER SYSTEM



THE Sanymetal PRODUCTS COMPANY

1705 URBANA ROAD
CLEVELAND, OHIO

November 3rd, 1926.

Wiborite

The Ault & Wiborg Co.
Varnish Works,
Cincinnati, Ohio.

Gentlemen:

Some years ago we investigated many makes of lacquer to use on our partitions, and especially for use on cubicles in Hospitals.

The result was our selection of Wiborite lacquer which we have used since that time. The reasons for this is because over a strong prime base the lacquer adheres to the steel, its durability is superior to the ordinary baked enamel and with its use it is not necessary to rub or polish the work after applying.

Many repeat orders have come to us for Hospital work because of the excellent finish we obtained.

Yours very truly,
THE SANYMETAL PRODUCTS CO.
R. A. Carpenter
President.

RFC:K

Wiborite is made in 46 colors. Write for color card and complete details.

The Ault & Wiborg Co.
Established 1849
Varnish Works Cincinnati, Ohio